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TOMORROW

COMPLETE NEW $2.00 BOOK-LENGTH NOVEL by JOHN TAINE

MARVEL SCIENCE STORIES

A RED CIRCLE MAGAZINE

15¢

APRIL-MAY



NEWSCAST by HARL VINCENT

APRIL-MAY MARVEL 15¢

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30x4.50-21	2.40	1.15
28x4.75-19	2.45	1.25
29x4.75-20	2.50	1.25
29x5.00-19	2.85	1.25
30x5.00-20	2.85	1.25
5.25-17	2.90	1.35
28x5.25-18	2.90	1.35
29x5.25-19	2.95	1.35
30x5.25-20	2.95	1.35
31x5.25-21	3.25	1.35
5.50-17	3.35	1.40
28x5.50-18	3.35	1.40
29x5.50-19	3.35	1.45
6.00-17	3.40	1.40
30x6.00-18	3.40	1.40
31x6.00-19	3.40	1.45
32x6 00-20	3.45	1.55
33x6.00-21	3.65	1.55
32x6.50-20	3.75	1.75
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32x4	2.95	1.25	30x5	3.65	1.65
33x4	2.95	1.25	33x5	3.75	1.75
34x4	3.25	1.35	35x5	3.95	1.75
32x4½	3.35	1.45			

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34x5	4.25	2.25	36x8	11.45	4 95
32x6	7.95	2.95	40x8	13.25	4.95
36x6	9.95	4.45			

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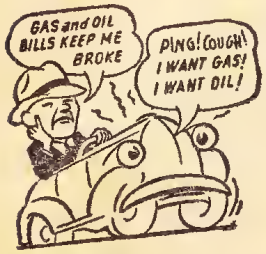
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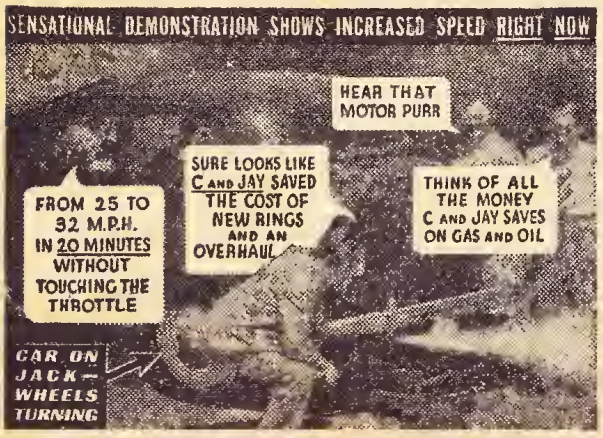
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NEW PROVED SCIENTIFIC METHOD CONDITIONS MOTORS SLUGGISH from GUM-STUCK RINGS and VALVES IN 20 MINUTES



SAVE MONEY ON GAS-OIL

There's no need to pay $15-$40 for new rings or valve grinding or $100 to rid your motor of sticky carbon, gum or sludge. Now C and JAY, an amazing new scientific method conditions both combustion chamber and crankcase parts. Amazing results **while you wait.** No special tools needed. Contains no mica, no sealing or plating compounds or graphite.

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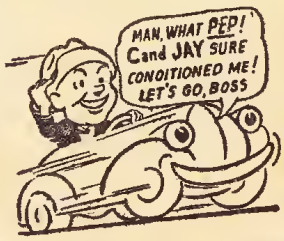
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Speedometer tests show as much as 7 *m. p. h. increase* in speed *without touching throttle.* Tests show increases in compression up to 202 lbs. on 1930 Oldsmobile — 142 lbs. in 1934 Terraplane—190 lbs. in 1936 Ford—116 lbs. in 1937 Packard. Coupon brings you other surprising test reports and testimonials.

C and JAY sells to the public for less than the cost of spark plugs and has a money-back GUARANTEE of satisfaction. Motors are protected by up to $5000 product liability policy of one of the world's largest insurance companies.

Try C and JAY now while this full-size package offer is still on. So RUSH COUPON TODAY!

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References: K. C. Banks, K. C. Chamber of Commerce.

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NEW SENSATIONAL MERCHANDISING PLAN C and JAY District Managers and distributors are putting on our spectacular and truly convincing **Super Sales Parades and Circuses.** We also have (if desired) dealer consignment deal with 100% insurance protection for you.

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"MADE $632.36 ONE MONTH I'm highly pleased with results. Your sales promotional ideas get the job done."
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A Mechanical Fountain of Youth

A Discussion of This Month's Cover by EANDO BINDER

How would you like to step into a machine, vested with strange but scientific powers, and come out vibrantly young (if you are past youth), ravishingly handsome (if you wish), and in vigorous, sparkling health?

The well-known artist, Norman Saunders, has depicted such a machine on the cover of this issue of MARVEL—a Mechanical Fountain of Youth. Hopeful souls, before and since Ponce de Leon, have searched for such a mythical source of physical well-being, all through history. Can science one day fulfill the miracle?

Let us assume it is some future year, and whatever age you are now, you are in need of rejuvenation by then. You enter the Youth Emporium, pay the fee (in accordance with your pocketbook, perhaps), and the Operator questions you. How young do you want to feel—about twenty-one? How handsome do you want to look—like the current matinee idol? And the best of health, of course?

"Step this way!" says the smiling Operator, guiding you into the apparatus. You are surrounded by glass and mechanical contrivances, and you try to remember if your insurance is paid up, but the Operator smiles reassuringly. He has stipulated that he will use no drugs, no knives and will cause you no pain. He steps to a panel of controls, and moves a lever slowly.

You start as a humming sound arises and your skin tingles all over. An inductive field of electrical forces is bathing your body, penetrating inward with a soothing sensation. The innumerable cells, tiny batteries themselves, are being recharged. Old, worn-out tissue awakens to new life and activity. Flesh rejuvenates under the magic touch, becoming more surcharged with vital forces that have slowly drained out through the years. The electro-chemical peak of the body's metabolism is once again attained. You awaken from a blissful doze some time later, feeling like a new person. One is as old as one feels, and you feel like—twenty-one!

Now the tingling ceases. The Operator moves another lever. You experience a new sensation, that of something probing you in localized spots. You roll your eyes and notice several distinct beams of violet touching you—artificial gamma-rays of just the right intensity to penetrate flesh but not harm it. One beam impinges at the base of your brain, focused on the pituitary gland, and corrects its secretion-rate by an infinitesimal, but very important, amount. The ionic-beam, regulating secretion by controlling acidity, next stimulates the thyroid gland, in the neck. Here your metabolism is slightly altered, toning up your whole system. Another gamma-ray centers on the adrenal glands, in the abdomen, and soon a tide of strength flows through you, as adrenalin sweeps into the blood stream.

Your heart pumps more strongly now, your lungs take deeper breaths. All the accumulated poisons of past years are cleaned out, as the readjusted glands perform their proper duties as regulators of all the organs. Lurking disease germs vanish under a wave of reinforced leucocytes—white corpuscles. There is a thorough house-cleaning going on, through every inch of you, as the gamma-rays stir these ductless glands to the proper pitch of activity. Even your brain feels cleansed, awakened, and you glow with health. You feel happy simply because you have a sound mind in a healthy body.

So far so good. You feel young and healthy, but you were promised gracious looks also for your fee. You still have a large nose, pointed chin and not too shapely body. The Operator nods and moves a third control. Now something touches your nose, shaping it. It is a mitogenetic ray, the fundamental wave-energy of growth. Under its powerful influence, positive or negative, flesh grows or withers. With this intangible tool of plastic surgery, the Operator reforms you almost at will. He pares down your nose, with deft touches. He smooths the curve of that chin. He does wonders with your body.

The treatment is done. You step from the machine, and look in a mirror. You are astonished at the wonderful transformation that the Mechanical Fountain of Youth has wrought in you and you hurry off to surprise all your friends.

Fantastic? Impossible? Remember that biology is one of the youngest of sciences. The study of glands, of the electro-chemical nature of life, and of mysterious vital forces is gaining rapid momentum toward what today is—fantastic.

The Magazine of Super-Science Stories

MARVEL SCIENCE STORIES

15c

ALL STORIES BRAND NEW!

Vol. 1, No. 4 — *April-May, 1939*

Big 70,000 Word $2.00 Novel

Page

TOMORROW 12

by John Taine

Dakan knew that the most desperate resource of his fellow-scientists could stop that frightful hydrogen-helium plague that was wiping out civilization—a scourge of disintegrating titanium, its disastrous secondary vibrations turning animal cells to plant cells, metamorphosing agonized mankind to masses of fungoid growth! But even as Dakan fought for his lovely Kate, greater chaos was to come when the entire world was plunged into war—and the vengeful arm of scientific might reached out to harness the terrible atomic energy of the sun itself!

An Exciting Short Story

NEWSCAST 119

by Harl Vincent

Reporter Tom Burke constructed a polyceltron iconoscope that would synchronize sound and vision—and scandal-blasted a city-wide political intrigue with that all-seeing broadcast televisor!

Science Reader's Departments

Under the Lens 6

Excursion to Possibility 116

What's Your Question? 128

What's Your Answer? 129

This Month's Cover:

Norman Saunders, inimitable science-fiction cover artist, gives his conception of a beauty parlor of the future—A Machanical Fountain of Youth.

READ MARVEL'S COMPANION SCIENCE STORIES MAGAZINE!

In the New Issue Now on Sale

DYNAMIC SCIENCE STORIES

A Book-length Novel

The Prison of Time, by Eando Binder, plus 3 Top-notch novelettes by Ed Earl Repp, L. Sprague de Camp and Frederic Arnold Kummer, Jr. Also an unusual short story by Manly Wade Wellman, plus interesting science departments and features.

MARVEL SCIENCE STORIES published bi-monthly by Western Fiction Publishing Co., Inc., RKO Bldg., Radio City, N. Y. Office of publication, 4600 Diversey Ave., Chicago, Ill. Editorial and Executive offices, RKO Bldg., Radio City, N. Y. Entered as second class matter April 25, 1938, at the Post Office at Chicago, Ill., under act of March 3, 1879. Yearly subscription, 90 cents.

THIS BIG MONEY-MAKING OUTFIT...



Get Started At Once In a Fine Paying COFFEE AGENCY

How would you like to have a fine paying business of your own—a simple-to-run Coffee Agency with immediate earnings up to $40.00, $50.00 or $60.00 in a week? Here's your big chance if *you act now. For only $1.00,* I'll furnish your complete business equipment (actually valued at $7.20) containing absolutely everything you need to begin making big money at once.

But don't send me any money now—I just want your name. If you are an active and reliable man or woman—and want to better yourself—want cash to spend, money to save, the means to live in comfort—let me show you your big chance. A dignified Coffee Agency of your own, an all-year-round business, easily managed, requiring no experience, no special skill. Whether you operate part time or full doesn't matter. *And you don't risk a cent.*

I'm not asking for money. I want you first to send for all the free facts—then decide. I want you to see how you can make money fast—all on a good-faith deposit of only $1.00.

BE A FOOD DISTRIBUTOR

I'll send you a Complete Display Outfit (actually valued at $7.20) to help you establish a money-making NEIGHBORHOOD COFFEE AGENCY, without money risk on your part. And I am willing to extend credit, so you can build a big paying business on my capital. My Food Distributors make good money because they handle daily necessities people simply must have. The products are nationally known for high quality and value, and *absolutely guaranteed.* You make calls on your list of regular customers, take orders, make deliveries and pocket your profits on the spot.

$129.00 IN ONE WEEK

Scores of men and women write me about their wonderful cash earnings. Sworn statements show clear cash profits of $47.50 to $146.00 made in a single week. Norman Geisler, of Michigan, reported $129.00 in a week; W. J. Way, of Kansas, with us nine years, reported $19.10 in one day; Gunson R. Wood, New York, $82.10 in one week; Mrs. Ella Ehrlicher, Missouri, $85.00 in a week. Ruby Hannen, West Virginia, $73 in a week. I don't say that everyone makes that much. Some are satisfied with less. But it shows your big possibilities! Get the free facts. See for yourself.

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Any earnest man or woman can make a success as a Food Distributor. In addition to the Complete Display Outfit, with a big assortment of full-sized packages, I also send a simple, sure-fire Plan which anyone can follow. I also send you advertising material, samples to give away, and everything else you need to make good profits your very first day. I guide you and help you all along. You, of course, can get groceries and other household necessities for your own use at wholesale prices—*so you save as well as earn.*

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This is a sincere offer made by an old-established, million dollar company operating from Coast to Coast, and noted for square dealing. Begin earning at once. Unless you make a trial you'll never know what fine profits may be waiting for you as owner of your own Coffee Agency. Strike out for yourself—be independent—free of money worries. You don't risk a penny and you have everything to gain by getting the free facts AT ONCE! Mail the coupon or a postcard NOW!

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SEND NO MONEY
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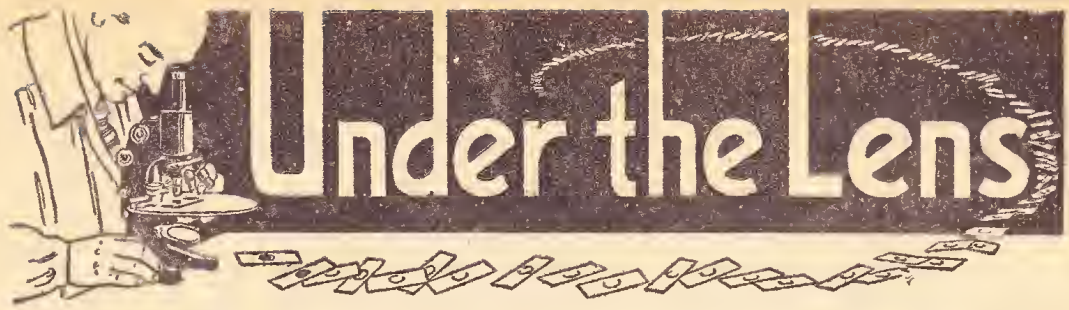
Without obligation to me, please send me at once full free facts about how you'll help me establish a money-making Coffee Agency through which I can make up to $60.00 in a week.

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(Please print or write plainly)

★ ★ ★ ★ ★ Sales Mean Jobs—Buy Now—Buy American ★ ★ ★ ★ ★



MARVEL PIONEERS

Dear Editor:

Aha! A new science-fiction magazine on the newsstand: MARVEL! What could any loyal fan say except "Great!"? Sorry I missed the first issue; enclosed you'll find 15c for which please send me the August number. It simply would not do to be minus it in my collection.

It's certainly good to see Paul on the job again. The Novemher cover reminds us of old times. With he and Wesso alternating on color-work, there seems to be no danger of cover deterioration. An occasional Binder illustration is welcome, of course; hut either finance Marchioni to an art course, or keep him off the pages. He can't compare with Wesso, or anyone else, for that matter.

The stories are improving. Coblentz' shorts, while their plots are admittedly old, are readable and entertaining; they "hang together" in a way that is indicative of skilfull writing. And of course we're all glad to see Keller on the job again. As for "The Time Trap"—well, all I can say is that it must have sneaked in when nobody was looking (you see, editor, I'm giving you the benefit of the doubt). So much for the November issue.

I like the idea of going in for book-length novels. Serials are okay in monthly magazines, hut not otherwise. So you are in line for a pat on the back for giving us "After World's End"—and by Williamson, too. All the departments are fine, besides.

Willy Ley's article is really superb. This article is typical of what an article in a science-fiction magazine, in my opinion, should he. The stories are futuristic —so why not the articles? And Ley's certainly is. MARVEL has pioneered in printing this; just keep up this policy and no one will complain. I liked it better than dozens of stories I've read (and I've read s-f since 1926), and that is putting it mildly.

Of course I'd like to see MARVEL go monthly; who wouldn't?

Langley Searles
19 East 235th St.
New York City

A TRULY GREAT STORY

Dear Editor:

You will no doubt remember me as the perpetuator of a very uncomplimentary letter in regards to the first issues of MARVEL SCIENCE STORIES, if for that matter you remember me at all. However, to show that I am perfectly willing to give credit where credit is due, I now declare myself for the magazine 100%. Your first two issues were very undesirable and not at all scientifictional, but the 3d issue of MARVEL SCIENCE STORIES, and DYNAMIC SCIENCE STORIES' first issue, certainly show that the editor is now trying to put good science-fiction magazines on the market, and to this end he has succeeded most admirably. Like your companion mag, M.S.S. had a truly scientifictional cover, especially by Paul. I hope you continue to have covers of that nature, and you'll have my undying gratitude.

The feature story, AFTER WORLD'S END, was a truly great story. Not using "great" as a synonym for "good," hut one of the immortal stories of science-fiction. It ranks with his LEGION OF SPACE and other great stories, that shall ever be remembered as long as one scientifiction enthusiast lives. There is little use going into a long enthusiastic paragraph, but suffice it to say that the story is representative of true science-fiction, such as it was intended to be from the start. Let AFTER WORLD'S END serve as the guiding beacon of the editor, and if he never accepts a story that would look cheap and mediocre against that story, then we will always have a good magazine, if not the best.

Your short story array was without a doubt the best collection in one issue of one magazine for the entire year of 1938. Congratulations. I can't see where you got them. FASTER THAN LIGHT was excellent, an outstanding story.

THE WEATHER ADJUDICATOR had a sense of humor in the way the story was written, even though the plot was most serious. It too is remarkably good, almost amazingly so. Your fact article was neither dry nor boring—excellent. THE SECOND MOON a little gem. VAST BEYOND CONCEPT, was good beyond concept.

Two months ago I was praying that your magazine would go bankrupt, and get its unwanted name off the newsstands. Now I am praying that you will always be on the stands, for the magazine is a true, representative of scientifictional literature. Frankly, I am overwhelmed with the third issue; it seems impossible that such a radical change for the better could happen in one issue.

T. Bruce Yerke, Secretary
Los Angeles Chapter, Science-Fiction League
1207½ N. Tamarind Ave., Hollywood, Calif.

TIMELY

Dear Editor:

You hit a timely story with Cohlentz's fine little yarn "The Weather Adjudicator." Ahout a week after MARVEL hit the stands, that odd cold wave and storm flowed down over Europe in particular over Berlin and Rome carrying the temperatures to new lows. Shortly afte a similarly unusual freezing wave came down on North America from Alaska. Both severe and unexpected cold waves originated somewhere deep within the Soviet Union in Siberia. And the "New York Times" suggested in an editorial that perhaps the wave of cold over the fascist European capitals was heing directed by a power seeking to embarrass them in their economic plights. Perhaps the Adjudicator is a reality!

Donald A. Wollheim
801 West End Ave., New York City

WANTS JOHN TAINE

Dear Editor:

You are certainly obliging, aren't you? First we requested a cover by Paul. Paul appeared on the second cover. And not content with that, many readers requested Wesso to illustrate the cover of MARVEL. And with the third issue Wesso returns as cover artist. His scene from "After World's End" was excellent, although the first impression I received from the drawing was that those tubular space ships were extinguishing the flames, and what do I find but that they are responsible for the immense fire, and it is not water they are shooting, but deadly rays! I hope you maintain your excellent covers; all three have been very good, with Wesso's probably the best. Let's have Paul and Wesso on the covers exclusively.

After having read the entire issue, probably the first thing noticeable is the fact that your editorial policy has undergone some radical changes. There are no more of those—uh—"romantic" stories, which is indeed gratifying. Furthermore, the plots of the stories are very advanced, which is a good sign. However, do not reject a well-written story merely because the plot is dated. I wouldn't term the plot of "Mutineers of Space," in the first DYNAMIC, exactly original. Still, it made very interesting reading. Anyway, you are attempting to give us a good magazine, and have succeeded already as far as I'm concerned.

Every story in the current issue was well-worth reading, with several very much so. Jack Williamson's "After World's End" was, despite its vagueness in spots, quite interesting. I like your policy of presenting a complete novel each issue. It is much better than having serials. I have heard that John Taine

(Please turn to page 129)



I jumped from $18 a week to $50
-- a Free Book started me toward this
GOOD PAY IN RADIO

HERE'S *How it Happened*
by S. J. E.
(NAME AND ADDRESS SENT UPON REQUEST)



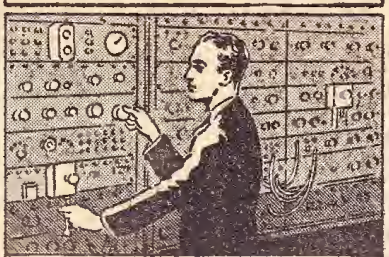
"I had an $18 a week job in a shoe factory. I'd probably be at it today if I had not read about the opportunities in Radio and started training at home for them."



"The training National Radio Institute gave me was so practical I was soon ready to make $5, $10, $15 a week in spare time servicing Radio sets."



"When I finished training I accepted a job as serviceman with a Radio store. In 3 weeks I was made service manager at more than twice what I earned in the shoe factory."



"Eight months later N.B.I. Employment Department sent me to Station KWCR as a Radio operator. Now I am Radio Engineer at Station WSUI. I am also connected with Television Station W9XK."



"N.B.I. Training took me out of a low-pay shoe factory job and put me into Radio at good pay. Radio is growing fast. The field is wide open to properly trained men."



J. E. SMITH,
President
National Radio
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Established 1914

Find out today how I Train You at Home
to BE A RADIO EXPERT

Many Radio Experts Make $30, $50, $75 a Week

Radio broadcasting stations employ engineers, operators, station managers and pay up to $5,000 a year. Fixing Radio sets in spare time pays many $200 to $500 a year—full time jobs with Radio jobbers, manufacturers and dealers as much as $30, $50, $75 a week. Many Radio Experts open full or part time Radio sales and repair businesses. Radio manufacturers and jobbers employ testers, inspectors, foremen, engineers, servicemen, and pay up to $6,000 a year. Automobile, police, aviation, commercial Radio, loudspeaker systems are newer fields offering good opportunities now and for the future. Television promises to open many good jobs soon. Men I trained have good jobs in these branches of radio. Read how they got their jobs. Mail coupon.

Many Make $5, $10, $15 a Week Extra in Spare Time While Learning

The day you enroll I start sending Extra Money Job Sheets; show you how to do Radio repair jobs. Throughout your training I send plans and directions that made good spare time money—$200 to $500—for hundreds while learning. I send you special Radio equipment to conduct experiments and build circuits. This 50 - 50 method of training makes learning at home interesting, fascinating, practical. I ALSO GIVE YOU A MODERN, PROFESSIONAL, ALL-WAVE, ALL-PURPOSE RADIO SET SERVICING INSTRUMENT to help you make good money fixing Radios while learning and equip you for full time jobs after graduation.

Find Out What Radio Offers You

Act Today. Mail the coupon now for "Rich Rewards in Radio." It's free to any fellow over 16 years old. It points out Radio's spare time and full time opportunities and those coming in Television; tells about my training in Radio and Television; shows you letters from men I trained, telling what they are doing and earning. Find out what Radio offers YOU! MAIL COUPON in an envelope, or paste on a postcard—NOW!

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President,
Dept. 9BK1,
National Radio
Institute,
Washington,
D. C.



J. E. SMITH, President, Dept. 9BK1
National Radio Institute, Washington, D. C.

Dear Mr. Smith: Without obligating me, send "Rich Rewards in Radio," which points out spare time and full time opportunities in Radio and explains your practical method of training at home in spare time to become a Radio Expert. (Please write plainly.)

Name..... Age.....

Address

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TOMORROW

By

JOHN TAINE

Author of "The Purple Sapphire," "Quayle's Invention," "Green Fire," etc.



CHAPTER I

Cleaned Out

"THAT'S enough Wilton."

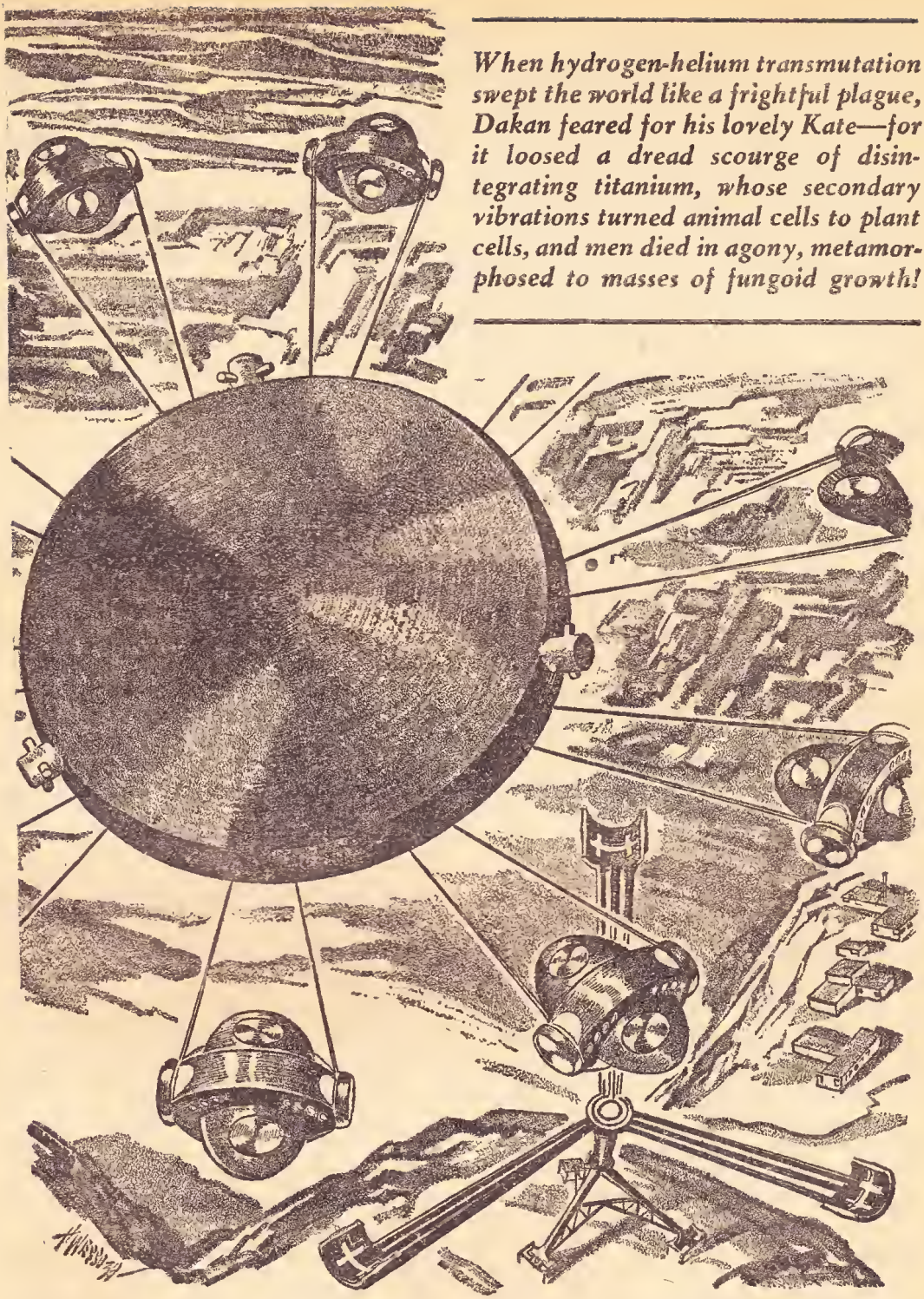
"It's only 3:15, Mr. Dakan," a protesting voice echoed up from the darkened switchboard below in the vast titanite pit.

"I know, but my neck's about broken, and I don't feel like another exposure."

A button was pressed, a switch opened, and from the far darkness of some subterranean chamber a muffled clank echoed in the gloom of the dome and up to the observer's platform. A final faint click, and the stupendous interior leapt into stark light. Severely void, save for the intricate web of invar forming the barrel of the gigantic telescope, and the more massive network of broad steel girders supporting the webbed barrel in a hairtrigger balance, the vast cavern of the dome, suddenly illuminated, was as overpowering in its impression of immensity as the night sky itself. After six hours of total darkness the comparative glare was all but blinding, and the exhausted astronomer involuntarily pressed his fists into his aching eyes.

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When hydrogen-helium transmutation swept the world like a frightful plague, Dakan feared for his lovely Kate—for it loosed a dread scourge of disintegrating titanium, whose secondary vibrations turned animal cells to plant cells, and men died in agony, metamorphosed to masses of fungoid growth!



"Shall I come up and fetch the plate?" Wilton called.

"Don't bother," Dakan replied. "I'll bring it down with me."

Before unclamping the plate holder from the side of the telescope, Dakan painfully divested himself of two overcoats and a sweater, stretched and yawned prodigiously. For six nerve-racking hours he had been sitting practically rigid, his eye glued to a tiny aperture, and his tense arms guiding the broad steering wheel, with infinite delicacy, to keep the image of the key star

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exactly on the intersection of the spider-web cross hairs of the eyepiece. Even in our modern age we have not learned to dispense with the human element in the guiding control of our most delicate mechanisms.

To a powerfully built and athletic young man—Dakan was tennis champion of his State—such a cramping of mind and body for six hours without a second's intermission was little better than slow and exceedingly refined torture. Yet he had stuck it out, night after night, because he had seen a great vision—although he himself would have been shot rather than put it that way—and because he confidently expected, before he was a year older, to glimpse at least the beginning of a greater.

Joining his elderly assistant on the floor of the vast pit, Dakan handed him the precious plate holder, a heavy box of titanite and quartz fully a yard square.

"Don't drop it," he admonished, only partly in jest.

They still had two hundred feet or more of precipitous, narrow steel stairways to descend before reaching the ground level and an exit. It had taken the tireless observer a little better than three hundreds hours of backache, straining arms and burning eyes, spread over the comparatively moonless nights of three months, to obtain that enigmatic record of an invisible warfare at the very limits of the universe, a hundred billion light years away from our galaxy and all its stars.

Reaching the ground level, Dakan excused himself, and hurried down still another narrow steel stairway, a hundred feet underground.

"Hadn't I better come too?" Wilton called after his departing Chief. "Regulations—"

"It's all right for once, Wilton. I'll see that everything is O.K. Hang onto that plateholder."

Cutting official red tape, Dakan alone carefully inspected the driving clock to see that it had indeed stopped, stared keenly up at the underside of the five hundred foot mirror of the giant telescope to make sure that nothing was amiss, inspected the burglar alarms, switched off a light, hurried from the concrete and steel vault—the holy of holies of the greatest observatory on earth—locked the heavy titanite door behind him, and bounded up the steps to rejoin Wilton. Already he was feeling fit again, not a day over his twenty-eight years, and entirely out of sympathy with the cramped, somewhat dejected young man he had been a brief five minutes before.

"Shan't you want your coat?" Wilton suggested, his hand on the combination of the steel exit door.

"No. It's only a step to the hutch."

Wilton, a trusty mechanic and veteran switchboard operative twice Dakan's age, looked his disapproval. It was part of his job to see that his young chief took reasonable care of himself. Buttoning up his own heavy overcoat, he preceded Dakan into the blazing starlight.

The sharp, keen air, clearer than a diamond, took their breaths away. For a moment Dakan regretted his superiority to a sensible suggestion. Resetting the combination, Wilton followed his vigorous companion down the steep, rocky trail to the friendly glow of two amber windows about a quarter of a mile distant. As yet no hint of the sudden dawn, that would presently overwhem the summit of the utterly barren range, revealed the beautiful desolations of the desert valley, a full two and a half miles beneath them. Without a further word they crunched their way down to the hutch.

ENTERING the night lunch room, the two were immediately enveloped in a caressing warmth, a polyglot babble of many voices, and an enticing aroma of boiling coffee, steaming hot chocolate, buttered toast and newly crisped bacon. Dakan thawed instantly, both inside and out.

"Bless the man who first found out how to transmit electricity without wires," he exclaimed with fervor, warming his stiffened hands and arms over the spotless electric range.

"What's up, Dakan?" a youngish man with a neatly clipped yellow beard enquired importantly. "Quitting early tonight?"

For a fraction of a second a shadow of distaste flickered over Dakan's strong, rugged features, and he slightly shrugged his shoulders. Quick to note the changing moods of his superiors, the bustling little man qualified his abrupt

query with a singularly maladroit compliment.

"Only joking," he gurgled in a masculine tone which, in spite of the very creditable beard, did not seem to fit him. "We don't need to be told you're no quitter. Pretty cold tonight?"

"Damned cold," Dakan agreed tersely. He turned to a black-haired, violet-eyed young woman.

"How's the coffee tonight, Miss Douglas?"

"Rotten," she acknowledged frankly. "Ruth and I had to throw ours out. Better descend to chocolate for once."

"Rather rough on me," the self-elected master of ceremonies expostulated. "I—"

"We know you did, Pobby," Kate agreed with a slightly malicious smile. "Hereafter you let Ruth and me order the supplies for the hutch. You can run the stellar universe; it won't make any real difference."

"Pobby" spluttered. Kate had flicked him on the raw, as he no doubt deserved to be flicked. In all that congenial family of about five hundred scientists, men and women, marooned some twelve thousand feet above sea level on an utterly desolate mountain top, Pobby—P. O. B. Yandell in full—was the one misfit. Pobby was one of those curiously inflated creatures who occasionally blunder into scientific research in the forlorn hope of enlarging their infinitesimal ego. Everyone knew exactly what the nickname meant, and no one was so cruel as to fling it at him while he behaved.

P. O. B. Yandell had been a boy wonder. He had not yet grown up. In the early days of his precocious rise to notoriety, some unsympathetic soul had dubbed him "Parnassus-or-bust Yandell." Thereafter he was plain Pobby to those whom he exasperated. So far, in spite of an early start and a phenomenal wind, he had not climbed Parnassus. The others did not aggressively dislike him; they merely did not care for his kind. His latest activity as self appointed supervisor of the kitchens and supply depots was fast driving at least the women on the Mountain to open war.

Wilton had now wedged himself in between two strikingly good looking young women. They seemed to welcome their somewhat fatherly friend as a mild and harmless diversion. In spite of early doubts of the Governors, flirtations were unknown on the Mountain. Nevertheless the men and women enjoyed the mixed night lunches—the only time other than a dinner that they ever met socially—as a slight reminder of what unscientific life was like, provided the mixing could proceed without the least hint of undue warmth. All were exiled for one purpose only—astronomy in all of its manifold ramifications.

Sixty days on the Mountain, followed by sixty off in the nearest city, three hundred miles away on the Pacific Coast, or in New York, or London, or Paris, as the fancy took them and the swift helioplanes conveyed them, year in, year out, was their not unhappy lot. On the Mountain they were nuns or monks; in the distant cities they were as human as they cared to be.

Having collected his piping hot lunch, Dakan squeezed himself in between a vociferous Japanese and a sad-eyed Armenian. Opposite, separated by three feet of speckless white aluminum, a beady-eyed young Chinese astronomer, a slightly cynical smile hovering on his aristocratic, aloof mask of a face, jovially regarded the weary newcomer.

"Well, Mr. Dakan," he cackled, "how go the celestial nebulae tonight?"

"Fine, Chou. Just got a three hundred hour plate of the N. G. C. 84 region cleaned up. One more, and I'll be all through. Any luck with your obsolete hundred foot tonight?"

Chou's mobile features registered acute disgust.

"Bum old instrument," he said in his quaintly Americanized way. "Why not put a stick of dynamite in the clock and blow it to hell?"

"The Governors mightn't like it—or you—if you did. I admit your instrument is an antique, but it's good enough for the prehistoric sort of stuff you're interested in. Anything new?"

Chou became gravely formal.

"Nothing new, Mr. Director. All as old as China. Older. Ha, ha!"

Seeming to find some obscure point in his ancient joke, Chou continued to chuckle drily to himself while Dakan attacked his toast and bacon.

TO any who had not realized that science is broader than all nations and considerably deeper than most human

nature, that animated company of about forty men and women would have seemed a strange gathering indeed. American girls chatted with orientals; one grizzled man, unmistakbly a negro, engaged a typical young Swede in lively debate, and all civilized languages were bandied freely back and forth in a most enchanting, highly expressive jargon of all tongues in general and no tongue in particular.

Strangest of all to an uninstructed onlooker, would have been the comparative youthfulness of the whole forty. Not more than three of all that lively party were over fifty; the average age of all was just over thirty; the Director of the whole colossal research, the deepest probing of the heavens yet undertaken, was barely twenty-eight and there were present mere boys of twenty-one or twenty-two who had stood more than one great theory of physics or astronomy on its head to shake out a better one. If it springs at all, the scientific spirit rises early in a man.

The older workers on the Mountain followed the advances of the youngsters with avid interest, and the young, it may seem strange to some, were without conceit. Dealing with nature at first hand and in the large, they realized that they too must presently give way to men better than themselves and probably younger.

Hardly had Dakan finished his lunch when a lean, wiry man, tanned like a hazel nut, his thick, curly auburn hair just going grey, laid a long, thin hand —the sensitive hand of an artist—on his young chief's shoulder and, bending down so those near could not overhear, spoke briefly.

"All right, Hardinge," Dakan nodded. Glancing up he noted the singular expression on the Englishman's face. Dakan stared slightly. What had upset the usually unexcitable Hardinge, who seldom betrayed his intense interest in everything, except when the outcome of the tennis finals or the England-Australia test matches was in doubt?

"England defeated again?" he quizzed.

Hardinge slightly shook his head, and glanced toward the door. Dakan looked puzzled.

"Now?" he asked in an undertone, aware that the violet-eyed Kate Douglas was watching them and the openly observant Pobby out of the tail of her consciousness.

"Wait till they go," Hardinge murmured "It's important. Really. Sorry to bother you, old chap."

"That's all right. I'll hang about till they leave."

Keenly watching Hardinge's face, Dakan poured himself another mug of steaming chocolate and lit his blackened briar. Hardinge had reseated himself by the electric range. He was thin, and he relished warmth. Also, from where he sat, he had a clear view of the whole company. It flashed into Dakan's mind that Hardinge was unobtrusively watching the carefree gaiety of that happy party for some hint of a restraint which would betray a secret guilt. What on earth could have happened? Dakan experienced a slight chill. Was another scandal, like the infamous iron-titanium affair of a generation ago, already hatched? Or was one only about to break its ugly shell?

All but five of the party were slightly hilarious, not to say boisterous. Chou seemed to have withdrawn into himself in an amused contempt for the follies of occidentals. Mamoulian, the obese Armenian, brooded sombrely over nothing. Ganesh Bhattacharyya, an elderly Brahmin, appeared to have attained Nirvana. In complete oblivion of what was going on around him, the Brahmin stared unseeingly at the lettuce leaf on his plate. There was nothing suspicious there, surely; he always rested that way after a night's gruelling work over his computations. Kate Douglas and Hardinge alone seemed troubled, deeply, anxiously.

Still speculating on that evil egg of his imagination, Dakan wondered why they did not break up, as they usually did about this hour. They were staying, as a matter of fact, merely because Dakan had dropped in ahead of his usual time. They all adored him.

Suddenly a soft crimson light from a six foot globe high above the door suffused the room, and a faint musical note hummed on the expectant air. Instantly a hush fell on the happy, babbling crowd.

"National headquarters calling," Kate murmured. "That's the New York tone."

"I'll take it," Pobby volunteered officiously, hastening to the receiver of the

radiophone before anyone could intercept him.

They endured his well-rounded "certainlys" in silence, till finally New York inconsiderately cut him off in the middle of one. He turned importantly to inform the company of the exclusive information which had been vouchsafed to him, P.O.B. Yandell.

"Mr. Andrew Merriman," he announced, "will arrive on the Mountain at 7:15 this morning for breakfast. His helio left London at sunset. He will stop off in New York a few hours before coming on. He chartered a high lane express. New York relays the data."

There was a dead silence for a few seconds. Kate broke it.

"Surprise party," she remarked ironically. "I wonder what he expects to catch us at? Lovemaking?"

HARDINGE shot her a warning glance. Ignoring it, she turned to Pobby.

"Anything further from our respected benefactor and boss?"

"That's all," Pobby admitted with a visible swell of pride. "Except that New York headquarters said they had been trying to ray us ever since Mr. Merriman's plane started across the Atlantic."

"Quite," Hardinge spoke up unexpectedly.

"Yes," Kate agreed. "I imagine they thought all of us but the Director and Mr. Wilton were in bed by now. It sounds fishy to me. Ruth, when did we order that coffee?"

"About eight, I should think. The transmission was perfect then."

"But," Pobby objected fussily, "you didn't order the coffee from New York, did you? We get our food supplies from Los Angeles."

"You may," Kate retorted. "Ruth and I know better. The rest of us prefer another brand. Well," she concluded airily, "there's no sense in arguing at this time of night. We should all be in bed." Catching Hardinge's eye, she gave Pobby no chance to linger. "Come on, Mr. Yandell, and show me that desert sunrise you're always raving about. I'll bet you've never seen one."

When the last of the departing footsteps had died away on the steep, starlit trail to the electrically heated cabins, Hardinge, who had been listening intently, turned to Dakan.

"I'm sorry that happened."

"What?" Dakan demanded.

"That New York called before they had gone. Ordinarily you and Wilton would have been alone at this hour. Now nearly forty of them know something is wrong."

Dakan was standing by the electric range, warming himself.

"What's up?" he asked coolly, fearing he knew not what.

"Hard to say. Personally I believe our old friend the devil is up and out and about to demand his pay. Brace yourself." He gave Dakan a full five seconds to prepare for the jolt. "The whole series of hydrogen-helium spectra plates has disappeared."

Dakan's long legs seemed to give way. He sat down heavily on a bench by the range. For some moments he was unable to speak.

"Sure?" he demanded at length, barely able to speak without unbecoming emotion.

"Quite."

"Good Lord! What if they fall into the hands of some get-rich-quick idiot who doesn't know their real purpose?"

"In that case," Hardinge admitted drily, "I should say we shall be dished. Properly, this time. This is no mere dollars and cents swindle like the titanium-iron affair of thirty-five years ago. If some ignorant fool puts the whole hydrogen-helium transformation onto his breeding of metals at once, he may let loose hell's own hurricane and wipe us all out with himself. But that isn't the worst of it—as you know, better even than I do."

"You are certain the plates have been stolen?"

"Positive. We've been cleaned out."

"But it's impossible! How could they ever get that weight of stuff off this place without our knowledge?"

"Easily enough," Hardinge replied grimly. "It is all so simple—after it has happened. Let me tell you how."



CHAPTER II

The Enemy's Heel

WE of the golden scientific age can hardly realize that the world was once considered large, and that it took a full six hours to span the United States in the federal passenger planes. Our own swift helioplanes, darting like summer midges across the oceans in the rarefied upper air lanes, fifty to a hundred thousand feet above the earth, have made the continents neighbors and "the whole wide world"—as it used to be called by the sentimentalists—a single state composed of many petty counties. Nationalism, we regret, still survives. Nevertheless we have abolished many of its diseases and have amplified those impulses of it which do not obstruct modern progress.

One consequence of the shrinking of the geographical world has been the practical elimination of crude, flamboyant crime. The severe efficiency of the world police has made robbery unprofitable, and the very proximity—in the only sense that counts—of all nations has rendered gaudy wars impossible. Retaliation is too swift and too easily within reach for our neighbors' goods to tempt us greatly. A major crime to be successful in our day must be devised and executed by men who have mastered at first hand the larger tactics of the impersonal Police service in both of its branches—air and land. And further, any band of nationalistic politicians not thoroughly familiar with the Secret Service division of at least one department of the world International Police, can have but a negligible prospect of success.

From the prescientific past a few of the semi-efficient customs of our predecessors, it is true, have survived. Thus, the universal police device of ignoring mere nations in their comprehensive "grid" of major divisions spread over the earth's surface, is a throwback to the ancient method of zoning cities into wards and districts. A letter and a number on the central call board at International Headquarters in London suffice to call the world forces, if necessary, without further orders, immediately to the seat of danger. So efficient are the international forces, that their designations of the police zones of the world have, in many instances, superseded the historical names of countries. Thus few now refer to the Northeastern United States as New England, preferring the shorter name, A 1, or "Ayewun," or to the Paci-Slope, or A 11, "Ayleven," and so on down the alphabet to the final letters for Africa and Asia. Few indeed will recall the historical names of some of these districts, which were unimportant before the age of metals, as X 9, "Ecksnein," of the Punjab for instance, or Zedten—the common English pronunciation of Z 10, the very heart of the modern metal industries.

To make gambling against modern police odds not utterly silly, the stakes must be inordinately high. Certainly the stakes represented by the missing hydrogen-helium plates were vast enough to tempt any band of thieves, with the most elementary inkling of their value, in the backward Ecksnein or Zedten of the Orient. Had the impossible crime been committed? Hardinge was convinced that it had in spite of all logic; Dakan had not yet absorbed the terrific shock of Hardinge's news.

Hours before the two men in the cosy hutch at the Observatory began discussing the theft, the crucial act in the drama of crime had topped its climax in the cold starlight twenty thousand feet above the earth's surface.

In the captain's cabin of a fast heliocruiser a man in his early forties, with an expressionless mask of a face, stood staring absently out of the port window at the fleeting starlit blur of rivers and jungles nearly four miles below. Presently he glanced at his pocket. For several minutes he sat staring intently at a triple row of fifty-one small quartz buttons along the upper bevel of the switchboard.

What he was expecting suddenly happened. The top and bottom rows of gleaming buttons flashed up red, the middle green. The signal was repeated five times. This was the general world alarm to all forces, air and land, of the International Police. Every station, over all earth, was receiving that signal, and the captain or chief navigator of each of the thousands of cruisers then

aloft over all the continents and oceans of the globe was seeing precisely the same signal as that on this thoughtful man's switchboard. Within ten seconds each man watching the danger signal would hear, in his own language, a clear, bald account of what he was to watch for, and a rigid command to do his duty under all conditions.

The ten seconds passed. One of the buttons glowed orange, and the radiophone began speaking raucously. The man at the desk listened impassively. Not a muscle of cheek or finger flickered. The South American air forces were to be particularly alert in executing the order which the immobile listener had just heard. So commanded international headquarters.

THE orange light dimmed off, and the man rose again, to stare dully down through the starlight at the rushing blur of impenetrable jungles and turbid rivers. The helio cruiser was already plunging through the night at top speed for its present altitude. To give an order at the moment would therefore be superfluous and stupid.

The cruiser began slowly climbing, to gain sufficient altitude to pass safely over the stupendous mountain range which the fliers must begin to surmount before they had cleft the starlight another five hundred miles. Almost simultaneously the captain's cabin was drenched with sudden scarlet light.

The man by the window leapt into quick, accurate action. His movements were automatic. Switching off the danger signal with one tensed hand, he reached for a white button on his desk with the other, his eyes fixed on a large rectangle of ground glass at the left of the switch board.

The glass glowed softly white. The trained eyes followed the mazy wanderings of eight tiny blue spots of light on the milky glass, as they traversed the intricate web of curves etched on the frosting. Eight cruisers of the airforce of the International Police had entered the flight zone in which his own cruiser was navigating. The scarlet danger signal had sharply warned him to proceed with caution. He reached for a pencil and writing pad and, with his eyes fixed on the wandering blue spots, jotted down their coordinates as he visualized them on the web of curves. Setting the position indicator on the keyboard at his right to the numbers he had just obtained, he pressed another button, and read off from the figures which flashed up on the indicator the positions and courses of the eight cruisers relatively to his own. The nearest was but a little over three hundred miles away, between him and the first stupendous range of mountains.

He must act immediately. The radiophone was already ordering him to sweep the thirteenth sector of the zone he was traversing. For his own position and course had also been instantly calculated in eight cabins like his own. The commander of the converging fleet of eight ordered him out of the sector already occupied by their nearest cruiser.

In response to a ruby and violet signal from the captain's cabin, the pilot of the speeding cruiser instantly ascended vertically a full two thousand feet. Then he shot due west to clear the rapidly nearing mountain range.

In the captain's cabin the radiophone demanded the nationality and number of the racing cruiser. The man in command stood perfectly still. Again, more sharply, the nationality and number of his cruiser were demanded. Still the man did not move. He merely thought. He was waiting for the customary etiquette of the air. Until the commander calling him should deign to identify himself, he was not bound to reply.

The identification numbers of the commander, also those of the seven patrol cruisers with him, came sharply and clearly from the radiophone in the international code. To allay whatever suspicions the listener may reasonably have had, the commander of the fleet added that he and his seven were members of the forest patrol, who had swooped into one unit on receipt of the general alarm from London. He, being senior officer of the eight captains in charge of the patrol cruisers, had assumed command and had ordered the seven to concentrate about him. They were now concentrating, and were already all in the same zone.

Still the man standing by the desk did not move. His eyes followed one of the wandering blue spots on the ground glass as he mentally estimated the position of the nearest patrol cruiser. He knew that

all eight were heavily armored and manned by police who would do their duty as unflinchingly as he was now doing his. Striding forward, he set the transmitter of his radiophone, and replied in the International code..

"I will pass over number seven and take the sector west of him."

"Your nationality and number?" the commander insisted.

"Bolivia. Upper Amazon Forest Patrol, Cruiser Number 47."

"Take the sector to the south of our number seven."

"Very good, sir." He again signalled to his pilot. The radiophone began a frantic protest, mingled with antiquated blasphemies.

"South, Captain, south! You are flying west."

"I must gain altitude first, to clear a spur of the mountains." There was no appeal to forgotten gods in the courteous reply.

"You are over twenty thousand up now. South! South—"

"My steering gear has slipped its control."

"You are headed directly for number seven!"

"There is no danger. I have signalled my pilot to rise. We shall pass well over him. Order number seven to flood his lights till I am safely over and past him."

The commander of the patrol transmitted the necessary order. The other flung open the cabin door and strode onto the bridge. Every man of the thirty in his picked crew had been drilled to the last detail for just such an emergency as this. They were already at their posts.

The seconds sped by, each bringing the approaching cruisers twenty miles closer together. The man on the bridge peered down through the purple night for the spark which he hoped presently to see. It rushed into the void like a firefly.

FOR five seconds the speeding cruiser kept its course, hanging like a suspended stone two thousand feet above the racing spark. Then it dropped, deliberately at first, but ever more swiftly as the glowing thing beneath it seemed to the man on the bridge to flame out and devour the darkness like the conflagration of a city. He could not miss this mark. The titanite heel of the cruiser, the massive metal pillar on which it balanced while resting on the ground, was suddenly shot out and down to its full length, and simultaneously the attacking helio reversed its motion, to soar vertically upward at its maximum speed.

Before the shattered victim crashed in the jungle nearly four miles below, the destroyer was speeding due north to elude its would-be pursuers and throw them off its track. It rocketed up to the forty thousand foot lane and shot east. Not even the nearest and swiftest of the patrol had the slightest chance of capturing their enemy. They were careful patrol cruisers; the murderer was not. Every second put another fifty miles between pursuer and pursued. In five minutes the escaping maverick would have passed far beyond range of the position indicators of the pursuing patrol. Then, zigzagging back and forth across the seldom travelled zones, it could work its way onto an unfrequented air way and safely proceed upon its homeward course. For the moment it must rise and hug the ceiling.

Long before the five minutes passed, the patrol had abandoned the pursuit, and the Commander had rayed his own national headquarters a staccato report of the disaster. The chief at headquarters coded the report instantly to London and waited instructions, his fingers on the switchboard and his ear to the receiver. He was requested to wait for fifteen or twenty minutes.

During the next five minutes the man in command of the fleeing cruiser sat like a rock at his desk, his code books open before him, closely deciphering the instructions for his capture being rayed from London to all quarters of the globe.

No common criminal could have eluded that close net which was being meshed over the world by the International Police. But the man at the desk, not being an ignorant criminal, read in those minute instructions the passport to his salvation. He now knew exactly what zones to avoid for every second of his homeward flight. While the world police were entering one zone, he would already have passed into an adjacent one, safely beyond range of their position indicators. Being in possession

of a complete set of code books, a luxury not shared by common criminals, he turned the very thoroughness of the police to his own desperate account. The world police would have stood some chance of capturing him if they had flown at random. Now they stood none whatever.

When the twenty minutes were up, the local national chief in South America who had reported, received his orders from London headquarters. Until further notice he was to give no hint of the truth to anyone. The International chief believed that complete secrecy, until the murderers were captured, offered the best chance of success. For the present the local national chief might inform all principals concerned that his patrols had discovered nothing, but that one had not yet been heard from. The last would arouse no suspicion, as it was common knowledge that helios of the river and jungle patrols frequently cruised for a week over their territory without putting in at civilization. Within three days surely, the International Police Chief asserted confidently, the murderers would be apprehended. Escape from the police net just completed was impossible; no man could get through it unobserved.

As the man at the switchboard of the cruiser overheard the last he did not even smile. There was no bitterness in his set face, though he realized only too bitterly in his heart that no man could escape what lay ahead of himself and his ignorant, devoted crew.

Not taking his eyes for a second from the position indicator, he zig-zagged his tortuous way, back and forth through the night and laggard dawn, homeward to duty and, he almost dared to think, stupidity.

CHAPTER III

To Be Solved

At a first optimistic glance it did indeed appear incredible that a wholesale theft could have been committed on the Mountain But, as Hardinge unemotionally stated the bare facts, the inviting openness to criminal attack of the most enviable research centre in the world became distressingly evident. Why had not the early Governors and the engineers responsible for the actual construction of the vast plant foreseen the obvious possibilities? It was merely another instance of the difficulty of foresight and the ease of hindsight.

The main buildings of the Observatory, as it was called, although research in all of the physical scienees as well as in astronomy was carried out on the Mountain, were slightly over two centuries old. They were the first complete product of the modern scientific age, and the first great monument to aeronautical engineering. To have erected such a metropolis of huge steel domes and bristling towers in the early days of the air-age, when transcontinental air freight lines first captured the entire transport trade of crops from the obsolete steamships, dying railroads and moribund auto lines, would have been possible, no doubt, but not practical. Such a feat would have been merely in the nature of a spectacular advertising stunt.

To have built the Observatory at all in the days of steam power, electric power, motor power and man power would have been impossible. The necessary road building alone over one of the world's most forbidding deserts and up the sheer, unweathered rock precipices of a major peak that no human being had ever succeeded in climbing, would have put the project beyond the dreams of any but lunatics. With the extraordinary advance in air freight technique in the first decade of its history, however, the transport of thousand ton masses of intricate machinery and their exact, delicate landing on a level expanse of living rock—blasted flat as a billard table from the air by military engineers—made the construction of the observatory in the contract time of ninety days a mere matter of simple engineering routine.

All this of course had cost a colossal sum, and it was only the beginning. Scientific equipment has ever been far more costly than the plant, ornate or sober, which houses it. Yet the rivers of money, in those early days of the scientific age, rushed in without slackening from popular subscriptions, generous private donations and government sub-

sidies. For it had gradually dawned on the whole nation that its bread and butter prosperity depended on abstract science, and on what, in the immediate past, most had regarded as the least practical of all the sciences.

Astronomy, almost overnight, became no longer merely the profitless hobby of a few dreamers and generous patrons of science, but a prolific source of revenue —stocks and bonds. Like nearly everything else that had been explored for its own pure sake, astronomy began paying lavish dividends. In that first golden flush of the scientific age, astronomy had become a necessity, the key to industrial supremacy, and therefore also to individual riches. Some at first, in that golden dawn, principally those past middle age, had deplored this "degradation" of the purest of all the pure sciences to practical ends. But as these inevitably passed on, and a more vigorous, less cantankerous generation succeeded them, it was agreed that human beings are not disgraced by trying to make themselves less uncomfortable and life in general more liveable. Incidentally, the tables were turned on the purists in a rather amusing way. The researches of their kind had started the scientific age; the industrialized bent of civilization had, in its turn, furnished the persistent dreamers with more new laws of nature and more astounding astronomical advances —tossed off as mere byproducts of commercial research—than ever the dreamers of the old school could have discovered unaided in a thousand years.

As one historic detail has an important bearing on the crime which was to baffle Hardinge and his collaborators for months, it may be recorded here.

The inception of the modern scientific age is now usually traced to the third decade of the Twentieth Century. In the ten years from 1920 to 1930, two discoveries, in widely separated realms of science, now stand out, like flaming mountains far overtopping their ages, as beacons of human progress. One, of course, was the brilliant series of experiments of Muller with vinegar flies, which marked the beginning of conscious, scientifically controlled and man-directed biology. The other, at first sight so remote from Muller's, is the first of the major classics—the epic in parvo of the Companion of Sirius—the Dog Star of prehistoric legend.

BRIEFLY, that ancient classic—for it *is* now ancient, so fast have we lived and so far have we travelled since the first beginnings of the modern age —is as follows: In 1915 Einstein published his theory of General Relativity and Gravitation. Light, he truly calculated, in issuing from a massive body, say the sun, must be "shifted toward the red"—the lines of its spectrum must shift as predicted. Numerous workers tested and seemed to confirm Einstein's prediction. The scientific world, composed at that time largely of men well past middle age, was unconvinced either by Einstein or by the scientists who checked him. Final confirmation came from a totally unforeseen direction.

Eddington, the pioneer astronomer of a new age, by a remarkable dovetailing of the crude physics and cumbersome mathematics of his day, predicted a deep and unexpectedly simple relation between the massiveness and the absolute brightness of gaseous stars. To his consternation, he found that our own sun fitted the law exactly. Then the obvious explanation flashed on him: our sun, after all *is* a perfect gas, and not a white-hot solid.

From there to the end was but a step. In the "scientific" jargon of that day, the very atoms of the chemical elements in the sun had been stripped of their outer shells of electrons, and therefore could be more densely packed together, while still, as a whole, behaving like the particles of a perfect gas. We, of course, would not resort to such crude metaphysics to explain an obvious fact.

Carrying the argument farther, Eddington deduced that the little white dwarf companion star of Sirius, invisible to the naked eye, or even to small telescopes, must be composed of matter so dense that a cubic inch of it would weigh about a ton. He then applied Einstein's prediction. Light, Einstein had calculated, in issuing from a massive luminous body, has the lines in its spectrum shifted toward the red end by an amount which depends on the massiveness of the luminous body. For the diminutive Companion of Sirius, the amount of shift toward the red worked out at about nineteen times that for our sun.

The final step was the actual measurement by Adams of the calculated shift. This work, as is known to every junior high school student of history, was successfully carried out, verifying both Einstein and Eddington, at the now all but forgotten Mount Wilson Observatory in California.

The success of that singularly acute prediction and experimental verification started two main tides in the forward surge of civilization as we today know it. The second of these, no doubt, was directly responsible for the theft which had staggered Dakan and Hardinge, and which threatened to wreck all further human progress.

First, there was the tremendous impulse to the construction of ever bigger and bigger telescopes. Real progress at first was slow. For twenty years, the hundred-inch, *inch*—remember, not *foot*—telescope on Mt. Wilson, the instrument used by Adams himself, stood without a rival. It may still be seen by the curious, exactly as it was when Adams used it, in the American Museum of Technical Science. Then, after a severe struggle, a two-hundred *inch* (again, not *foot)* reflecting telescope was built with infinite care and at a cost which now seems sheerly ridiculous. This was owned and directed by an organization which appears to have done much in its time to prepare the way for the modern age.

The California Institute of Technology will always be gratefully remembered by historians of the new age; it was without reasonable doubt the forerunner of the Observatory. Its chief claim to remembrance, is, of course, as every schoolboy knows, the construction of the two-hundred-inch reflector. Unknown to themselves, the builders of that curious old instrument had anticipated the chief difficulty in telescope construction, and had blazed their blundering way into the jungle of modern problems.

Thereafter progress was rapid. Within fifty years the first hundred-foot telescope was operating with perfect precision. Without that first faltering step into the unknown by the scientists and generous supporters of the historic California Institute, the Observatory on the Mountain never could have been.

Again, and inextricably interwoven with the whole history of the Observatory and of human progress since the dawn of the scientific age, was the thread of that first clue found by Einstein and Eddington to the true nature of metals and the laws of metallic conduction of electricity—the key to the wireless transmission of electric energy. And precisely there, unfortunately, appeared the first proof that although the world may be changed by man, his own human nature is, unstimulated and unaided, incapable of keeping pace with the conquests of science.

The Companion of Sirius had given scientists their first insight into the age-old problem of the transmutation—or "breeding," as most now prefer to say—of metals. The Observatory had pursued that tenuous clue through many a baffling maze to the central, final secret. Then, overnight, the millions of men and women who had contributed to the material advance of science were robbed of their just profit.

It has never been proved that the iron-titanium secret was stolen or, what amounts to the same thing, sold by some unscrupulous scientist to a private corporation of a backward nation. Nevertheless, it now seems morally certain that no private research laboratory, with its limited funds and cramped resources, could possibly have stumbled onto the first major discovery of the Observatory. Whatever may ultimately appear as the truth of this scandal of a generation ago, one thing is certain: it but confirmed what the more pessimistic members of successive governing boards had declared to be a humiliating fact: Science, as yet, had not made the slightest impression on the only human problem worth tackling—that of human nature itself.

REMEMBERING all this ancient, depressing history, Dakan had nearly collapsed when Hardinge told him that the helium-hydrogen series had disappeared. Those dangerous plates had been stolen—or so it seemed.

Therefore, highly selected human beings, put on their honor not to steal and not to lie, were still capable of both stealing and lying.

Science, it would seem had made but slight progress in the modern age. Human nature was still rampant.

No man or woman on the Mountain was below the second rank in science, and the majority were well up in the first.

Even the chief cooks and stewards were high-grade men and women. Only their drudging helpers and assistants—for we still require a minimum of menials—were a nondescript company of lower-grade South Americans and Orientals—Armenians, Hindoos, Bolivians, Mexicans and occasionally a derelict Chinese, Filipino, Javan, or Japanese.

Outside of such assistants to the cooks, bed makers, and freight handlers, every man or woman on the Mountain was a scientist.

Only the scientists had access to the missing hydrogen-helium plates. It seemed to follow, Dakan reflected bitterly, that a Director of a great scientific enterprise should not entrust pass keys to his staff, all of whom were his scientific equals, and at least a dozen of whom were his superiors in science.

Perhaps, after all, the die-hard artists were right; science made men and women selfish, callous, indifferent to the lot of their fellow men, and essentially mercenary.

Well, if so, that was what Dakan and the Governors were sworn either to disprove or, if it should turn out to be true, correct.

Only half a dozen of all those who worked on the Mountain knew the ultimate purpose of the elaborate research, now in its fiftieth year, to which all were dedicated. Each did his appointed job and asked no questions. They were interested only in their absorbing work and their play. The mathematician, poring over his subtle creations in the new operational calculus, did not ask, nor did he greatly care, to what end his abstract creations might be bent. The specialist on spectrum analysis, say the cynically devoted Chou, slaved at his plates, day in, day out, only to gratify the creative urge of his aesthetic nature and to contribute, however humbly, to the hoped-for solution of the Great Problem.

What was this great problem, which only half a dozen of the workers during any sixty-day period on the Mountain realized in its entirety? It is rather hard to state adequately exactly what it was. Briefly, the leaders in science had long since known that the human race, left to the slow mercies of natural evolution, could never hope to make itself worthy of the rich harvest which modern physical science poured into its eager hands. In all of this prodigal flood of new riches there was a constantly increasing element of extreme danger to the whole race. Selfishly applied, or criminally abused, the very wealth of the scientific age might well turn the whole world into a howling desolation overnight. To prevent such a disaster and to render it forever impossible was the central problem of the most powerful and the most efficient scientific organization the world has ever created.

The Observatory was the brain of the whole vast organization, which covered every country, civilized or but partly enlightened, with an intricate network of subsidiary scientific laboratories and research institutes. In all, some hundred thousand workers, scattered over the whole earth, devoted their lives to the solution of the great problem, the majority, of course, never dreaming to what far end their ceaseless labors were directed.

From four hundred to five hundred of the cream of the whole hundred thousand were carefully selected by the Governors to serve out their prime—usually between the ages of eighteen and thirty—on the Mountain, the very centre of the vast research.

An equal number, less fortunate from a material point of view, were selected to toil in the desert, twelve thousand feet below the summit of the Mountain, and to spend their exacting days in the vast labyrinth of burrows, scooped out from disused mines, by the last of the military engineers nearly sixty years before, in the roots of the barren ranges which cupped the desert heat. These were the biologists engaged on the great problem. Unlike most of the physicists and astronomers they knew exactly to what purpose their toil was being bent. Older for the most part than their collaborators on the Mountain itself, they were a more taciturn company and, perhaps, wiser in a purely human way. Their term of service was thirty days on, followed by thirty days off. In spite of all that modern science had done to alleviate the devastating heat and loneliness of the desert, a month of its overwhelming grandeur and

oppressive solitude was about the limit of human endurance.

THE deep mines in which the most of those silent biological workers toiled for eighteen hours a day, were even more depressing than the unbreakable blue of a cloudless sky that, from year's end to year's end, blazed down its merciless flood of light on a parched expanse of rock salt and borax which had not known the blessing of rain within the memory of man. At sunset or dawn, when a salt storm was not raging, the exhausted workers would emerge from their cool laboratories, a thousand feet underground, to take a breath of nature's own fresh air, only to turn with relief after half an hour of the colossal loneliness to the friendly galleries of their quartz-lined research rooms and corridors. Nature, as yet, had built her masterpieces on a grander, more forbidding scale than man had attained. As a constant companion, in her deeper moods, nature undefiled by human attempts at conquest, is overpowering and unlovable.

The great problem—that of making the whole human race not unworthy of what science poured into its receptive lap—had been attacked consciously at least twice in the past century. It seems incredible now that human beings could ever have dreamed that "law, order and decency," enforced by men whose intelligence would barely reach the fourth grade on our present scale, might provide a solution to the problem—that of breeding a race worthy of the title "human." Our schoolchildren today do not even learn the history of that egregiously stupid attempt, nor the names of the statesmen, kings and presidents, famous in their day, who were its messiahs.

The second failure has in it all the elements of pathos. Primarily it was sponsored by scientists—scientists, that is, of the last decade of the twentieth century. It seems so obvious now that any radical improvement of our human kind by selective breeding must be thousands of times slower than the general advance of science, that to refute the exploded doctrines of eugenics once more would be little short of cruelty. Those early authorities, breeding their super-rats, their amazing guinea pigs and their record-breaking cows, imagined that reasoning animals could be bred up to keep pace with the seers of their own species.

In theory they were right; in practice, wrong. Their slow program demanded millions of years for its completion; the great problem, if it was to be solved at all before human cupidity and short-sightedness had used the riches of modern science to cut its own throat, must be solved by new means and by methods which should leave laggard nature at the starting post.

Even in our own day the effete eugenists still argue that the scientists themselves are an instance of the correctness of their creed. It cannot be denied that many of the young men and women now on the Mountain are the offspring, in the third and fourth generation, of eugenic matings carefully planned. More than one famous family of scientists or public servants, persisting through at least three generations, traces its rise to eminence to the initial coercion of the eugenists.

But, as is now everywhere acknowledged, those early matings, forced by the almost forgotten International Eugenic Council, were pathetic mistakes. Ignorant of the essential element in all marriage, those withered spinsters and unfeeling old men of the World Mating Council, forgot what the older sentimentalists quaintly called "love." Without love, or its true equivalent as we moderns have recognized it, permanent improvement of the human stock must remain a theorist's dream and a barren counsel of impossible perfection.

The details of some of those historic forced matings still survive in our histories of morbid psychology. They remain, without doubt, the most shameful of all the scandals of our blundering race in its pitiful attempts to raise itself out of the primaeval slime in which it was conceived.

Dakan himself, also Hardinge, were great-great-great grandsons of the Eugenic Movement. That their distant fathers and mothers had been compelled to usher in the modern scientific age against the dictates of their own good taste and natural impulses, did not soften either of the descendants toward the conservatives who still demanded "a gentle guiding of nature and an upholding of her all-wise hands." The descendants of that lukewarm compromise knew better: nature, left to herself, or even

gently "helped," is slow, brutal, and blundersome beyond human patience. If the race is to survive and attain its legitimate majority, nature must be supplanted. So say the moderns. Dakan and Hardinge were modern.

With almost a sardonic twinge, Dakan recalled that the culprit responsible for the theft of one of the main keys to the great problem—for the hydrogen-helium spectra were no less than that—must have been a product of the Eugenic Movement. This in itself seemed to prove that those misguided enthusiasts had not succeeded in breeding out theft and lying. Dakan turned to Hardinge.

"Let's have it," he said. "Merriman, I suppose, knows all about it. Kate told him?"

"Yes," Hardinge acknowledged. "The coffee was all right. That was merely the excuse to throw Yandell off."

"You suspect Yandell?"

"I suspect nobody," Hardinge replied, "until he acknowledges his own guilt. Appearances mean nothing."

CHAPTER IV

Forced Down

DAKAN had taken a grip on himself.

"When were the plates first missed?" he asked.

"Just before I went to work after dinner," Hardinge replied. "About seven-thirty. Miss Douglas," he continued rapidly, "has been helping me with her plates. For the past sixteen days I have done nothing with the actual material."

"Busy with the computations, I suppose?"

"Exactly. Yesterday evening I ran out of data. I asked Kate to fetch plate 98 from my own first series and number 28 from hers. She was back in five minutes to report that the entire set—hers and mine—had disappeared."

"Why didn't you report at once?" Dakan asked. "I was just on my way to work."

"For a number of reasons. In the first place it seemed to Kate and me that we were being watched."

"By whom?" Dakan demanded.

"Well," Hardinge replied slowly, "we may have been mistaken. But we imagined that Yandell was taking rather a personal interest in our movements."

"Oh, Yandell," Dakan commented with a slight accent of contempt. "Just his natural, boyish curiosity. Go on. What were some of the other reasons?"

"The main one was this. Whether we guessed the thief or not—we haven't, as a matter of fact—it was certain that we should be watched. Whoever stole the plates must have known that I have not been using them for the past sixteen days. The thief might also know that I sent Kate to fetch those two yesterday evening. Any move on our part to interrupt you at your work would be interpreted as a signal that the theft had been discovered."

"If so, what then?"

"Don't you see? It is much easier, I should think, to spot an unsuspecting thief than to catch one who is fully warned. At least that was our theory."

"And how did you act on it?"

"By communicating at once with New York headquarters. To throw Yandell off, Kate told him that she and the rest of the women couldn't put up with his brand of coffee any longer. He has been fussing about the kitchens and supply depots for the past three months, you know."

Dakan nodded. "On the pretence of greater efficiency and better meals."

"You begin to suspect him?" Hardinge asked quickly.

"I suspect nobody—yet. Yandell meddles in anything and everything that doesn't concern him. What was Kate's message to National Headquarters?"

"A plain report of the theft, and a request that main headquarters in London be notified immediately. New York said it would report back about four in the morning—Kate asked them not to report at once. Unfortunately her ruse for privacy failed. The guilty one may by now be fully warned."

"Possibly," Dakan admitted grimly. "And, if so, the guilty party will be neatly caught. Do you suppose Merriman will let a single one of us off this Mountain before the theft is cleared up? Until it is, we may as well resign ourselves to an indefinite term of work. No more leaves for any of us. The last shift of scientific workers to take their two months off, left here nearly four weeks

ago. The plates were all safe then?" Hardinge nodded. "It follows that the thief is still here," Dakan continued. "And, in spite of what you say, I believe we shall find the missing plates secreted somewhere about the buildings. It is impossible that they can have been taken off the Mountain without our knowledge, as you seem to think."

"Not at all," Hardinge protested. "Do you know how it was done?"

Dakan shook his head uneasily. The other seemed so sure of himself that the Director began to doubt.

"We are as isolated here," Hardinge pointed out, "as a shipwrecked crew on a splinter of rock and ice at the South Pole. There is no road, not even a trail, up from the desert to the summit. As far as we know, no human being has ever climbed up here from below, and we are certain that no one has ever attempted to get down. The one way on or off is by the air."

"But the plates?" Dakan protested. "They must have been a dead weight of at least a quarter of a ton."

"Nevertheless," Hardinge persisted, "I will wager that those plates were taken off within twelve hours of the time the last were stolen. It might have been safer to send them off a few at a time, but for obvious complications at the other end. All or nothing—that's my guess. To be of any value, the entire series is required. Such a theft necessarily involved a considerable risk. Who took it?

"As I reconstruct the crime," he went on, "it was carried out by two distinct and independent parties, working without knowledge of one another's movements."

"How do you get that?"

"EASILY enough. The only planes that call here, except to take off or bring on members of the scientific staff, are the supply planes—milk, fresh vegetables, meat, bread and groceries. Not one man on all the half dozen planes that bring our supplies, but has been employed by his company for at least fifteen years. I know them all intimately. The same crews exactly are handling the planes as when I first joined the staff, a little over sixteen years ago. You know them all too, although of course not nearly so well as I do. I often pass the time of day with those fellows.

"What sort of men are they? You will agree, I'm sure, that every last one of them is just an ordinary decent chap, a typical commercial express flier, honest enough, but absolutely without brains in any sense that counts for us. The men of one of those crews were the innocent accomplices of the crook—or crooks—with brains who engineered the actual theft. I suspect the milk fliers."

"I begin to see it," Dakan groaned.

"It is fairly obvious, once you do. We use a lot of milk up here in the course of three days. Every other day one of the dairy's larger planes delivers a double ration and takes back the accumulated cases of empties. The bottles are carefully packed. Wouldn't it be easy enough for the actual thieves to remove some of the empties from, say, five of the cases, and substitute the hydrogen-helium plates in batches of about a hundred pounds each?"

Dakan strode to the long-distance radiophone and fingered the dials.

"No use," Hardinge informed him quietly. "Kate thought of that. She called Los Angeles too, while she was ordering that imaginary coffee from New York. The milk plane that left here with the empties late this afternoon was three hours overdue in Los Angeles. Either it is still down in the desert, or—"

"In Mexico hours ago," Dakan finished for him. For some moments he stood brooding in utter dejection. If this scandal were not cleared up soon—before any mischief might start from the ignorance or carelessness of the thieves—his term of office as Director of the Observatory was at an end. In simple honor he must resign the control to more careful hands. It was a humiliating end to all his work, the more so as a final assault on the great problem was rapidly becoming feasible. But for this unforeseen setback, another year might have brought at least the beginning of a solution. Suddenly his jaw set, and he turned the dials. He was not beaten yet, nor would he be by any crook. Getting his connection, he asked whether the milk plane from the Observatory had yet been heard from.

"No sir," a voice from New York replied, and then, "who is asking?"

"Mr. Dakan, of the Observatory."

"Can you identify yourself, Mr. Da-

kan? My own number on the A. B. C. code is 18817. You recognize me?"

"Yes. Mine is F 823."

"Then, sir," 18817 replied, "I am instructed by Mr. Merriman to say that the plane returned to Los Angeles, four hours late. He communicated directly with the milk company, and then informed us."

"I see. Everything all right?" Dakan asked, sighing his relief.

"Mr. Merriman will give you further particulars, sir."

Dakan was about to disconnect, when Hardinge brushed his hand aside and took up the transmitter.

"This is Hardinge, on the Mountain. Verify my number in the A. B. C. code. Got it? All right: I'm G 83152. Is that satisfactory? Right. See that the Los Angeles Chief of Police holds those milkmen on some technical charge—flying low over the City—anything he likes. What's that? Oh; I see. Very well; that's all."

Hardinge turned from the deadened instrument in disgust.

"What's up?" Dakan quizzed. He was feeling quite bouyant over the good news from New York.

"Nothing. Only I think it rather silly not to salt the tails of those birds."

"Perhaps they have. The man at Headquarters seemed to know what he was talking about. He said Merriman will explain."

"If he can," Hardinge admitted dryly. "There's been a leak here—the plates are gone. How do we know there hasn't been another on the plane?"

"But the crew, as you said, is above suspicion."

"For all that, they may know something."

"If so," Dakan sighed, "it's no use trying to do anything with that man at national headquarters.

"All he can say is that 'Mr. Merriman will explain.' I wish he were here."

As if in answer to the words, a shrill, distant drone deepened rapidly to a steady roar, apparently directly overhead.

"There he is now," Hardinge exclaimed, dashing for the door.

"Nearly two hours ahead of time. He must have taken a middle lane special from New York."

THE cloudless dawn had broken, throwing the hundred domes and turrets of the Observatory into hard relief against the stark blue vault of morning, and sculpturing once more the deeply scarred ranges into motionless masterpieces of chiseled color. Although it was broad daylight, the flood beacons on the level rock landing stage flashed on automatically as the helioplane, dropping like a stone from the zenith, suddenly slackened in its swift descent, and drifted vertically down, as lightly as a rose petal, onto the exact centre of the landing stage. Hardinge and Dakan were already on the stage when the steel door of the plane slid back, and a stoutish, elderly man stepped out. The porter closed the sliding door, and the special rose instantly, to soar back on its return flight.

Andrew Merriman was a gentleman of the older school, about sixty years of age, ruddy-complexioned, with just noticeable little white tufts that might have been sidewhiskers high up on his cheekbones, and keen, twinkling eyes. In his early days he had amassed great wealth as a banker in both North and South America. Tiring of what he found rather too easy a game, he had left banking when about fifty, in order to give his whole time and energy to the science which was his hobby. Not a professional scientist himself, he had done more for the advancement of science than any three professionals, by his shrewd insight into human nature and his deep sagacity in organizing vast researches, whose complete execution would demand the labor of thousands of professionals for at least a generation. Within the first five years of his retirement from banking he had risen to the very top of the whole vast union of scientific enterprises, of which the Observatory was only one, but a very important one.

If Merriman was disturbed by anything on his mind, his first words did not betray his agitation.

"That idiot of a man forgot to put in my lunch. Is there any coffee going at this time of day?"

"Plenty," Dakan assured him. "Come down to the hutch. Breakfast proper won't be on for nearly two hours yet. We can fix you up an appetizer in the meantime."

"Fine," Merriman agreed. "How are

you, Hardinge?" he inquired cordially, shaking hands.

"As well as you are, I hope," Hardinge replied.

"Meaning, I suppose, that you're rather anxious about everything? Well, to tell the truth, so am I. But let me get some coffee first. Ah, here we are. As cosy as ever, I see. Anyone about?"

They shook their heads, and Merriman continued in a lower tone.

"Miss Douglas has retired, I presume? Good; that was the sensible thing to do. To have stayed up beyond her usual hour could only have excited suspicion—where we don't want it. Anything the matter?" he queried shrewdly, seeing the look on Dakan's face. "Out with it."

While Hardinge busied himself about the electric range, Dakan briefly recounted the events of the preceding three hours. On its face everything was innocent enough.

"Forty of them know something is up, now," was Merriman's noncommittal comment. "Can't be helped, I suppose. Hadn't you better issue an order that all leaves are indefinitely suspended?"

"I was planning to do so," Dakan began, "provided—"

"Yes?" Merriman encouraged when Dakan hesitated.

"Provided the plates are still missing."

"Still missing or not, there's been a theft here."

"Then I'll see that the order is posted at once. Shall I give any reason?"

"Say one of the cooks' helpers is unaccountably ill. The whole Mountain is quarantined. It sounds pretty thin, I know, but it's the best I can do on the spur of the moment."

Dakan hurried off, leaving Hardinge alone with Merriman.

"Suspect anyone?" Merriman began.

"Not beyond the obvious accomplice somewhere in the kitchens or supply depots. I take it that the plates actually were recovered on the milk plane?"

"Wait till Dakan returns," Merriman answered, gulping his coffee. "What I want to know is this. Who stole the plates from the store room and took them to the supply depot? It must have been someone with a passkey. So one of the staff is guilty. It doesn't matter what underlings helped; it is the man—or woman—with brains that must be caught."

"I don't see," Hardinge objected, "that it is necessarily one of the staff who is guilty. Some of us are not as careful as we might be. Couldn't a dishonest bedmaker have taken an impression from a key left lying about by some member of the staff?"

Merriman eyed him keenly.

"Possibly," he admitted. "Yet I don't think so. And neither do you. Why?"

"BECAUSE," Hardinge admitted, "I always distrust vulgar curiosity, especially when it is overdone. It's English to do so, I know. But I can't help it."

"I see," said Merriman. He thought in silence a few moments. "I know the man you mean," he acknowledged finally. "And I think your suspicion is entirely unfounded."

"But—" Hardinge began.

"Circumstantial evidence," Merriman interrupted. "Miss Douglas told me enough about that man's recent activities as selfappointed head steward here, for me to guess what you are driving at. Now, Hardinge, I know at least as much about human nature as you do. Is it likely that a man who is essentially a fool could plan and carry out a major crime successfully?"

"Successfully?" Hardinge echoed in dismay. "You mean—"

"What I said. Here's Dakan. No danger of us being overheard here, I suppose?"

In answer Dakan shook his head, locked the door, and pocketed the key.

"New York headquarters told us the milk plane had returned to Los Angeles," he remarked, questioningly.

"Four hours overdue," Merriman replied. "Without a single milk case aboard. The fliers were forced down by a swift armored cruiser about a hundred and twenty miles west of here. The attackers, needless to say, were masked. Their plane bore no mark whatever of identification. They had chosen the loneliest spot of the desert between here and Los Angeles for their attack. After forcing the milkplane to land, they ordered the fliers out, and proceeded to transfer all the cases of supposed empties to their own plane. They wasted no

time in searching for the particular cases containing the stolen plates; they took everything, including the men's lunch box. They apparently knew exactly what they were doing. Having finished the robbery, two of the attackers began disabling the milkplane. They worked fast, but not fast enough. An express freighter from Boston swam out of the blue haze just as they were about to smash the main propeller head. They were scared off, and flew straight toward the Mexican border.

"Unfortunately the freighter did not see the disabled plane on the desert until the attacking plane was out of sight—it was as fast a one, evidently, as is built. The freighter descended, and stood by till the disabled milk carrier was sufficiently patched up to proceed under its own power to Los Angeles. That's about all."

"Did any of the attackers speak?" Hardinge demanded tensely.

"There was the first order to land, of course. That was in good, clear English from the radiophone of the attacking plane. While the cases were being transferred, one man dropped his end, and his companion cursed—apparently. The milkmen cannot say what language it was."

Dakan groaned. "If only we knew that, we might have something to go on."

"But we don't," Merriman rejoined quietly. "So we haven't even started yet."

"Can't the men imitate the sound," Hardinge suggested, "sufficiently well to give an expert linguist some clue?"

"The Los Angeles police have already tried that. I've been in touch with them constantly ever since I left London. Either their experts are no good, or the language is not in their repertoire. It may just have been a meaningless expression of irritation."

Hardinge's eyes gleamed.

"I think not," he demurred. "Even the most involuntary ejaculation will betray the irritated one's nationality." He turned to Dakan. "Will you make an exception of me, and let me off the Mountain before the rest read the order?"

Dakan turned to Merriman.

"You are in charge, now, Mr. Merriman."

"Nonsense! It isn't your fault that the plates were stolen. You are an astronomer, not a policeman. Still, if you wish my advice, I should suggest that you make an exception of Hardinge. Beyond checking up every detail of the milkmen's story, the police so far have made no progress whatever. Even the flimsiest chance is better than none. If Hardinge thinks something may be done in Los Angeles, he should go."

Dakan nodded. Hardinge was already fingering the dials of the Observatory local, to rouse the lazy aviator who drowsed away his days and nights on the Mountain, waiting for the emergencies that happened only once or twice in five years. In case of sudden serious sickness, or other unforeseeable accidents, a helioracer was part of the routine equipment on the Mountain.

"I'll be on the landing stage in two minutes," Hardinge announced. "What? Oh, bother your breakfast! We shall be in Los Angeles before you miss your ham and eggs."

Hardinge let himself out, and Dakan turned to Merriman.

"How about some breakfast yourself?"

"I've changed my mind. Let's take a stroll before turning in, and see how the new focalizers are coming on. It would do no good to meet them all now—my eyes are heavy and my head isn't as clear as it might be. I think I had better not show up till dinner time this evening."

They passed out into the blinding sunshine, and turned toward a levelled ridge of sheer rock about a mile away. On its table-top crest a gigantic tripod towered far up into the blue black of the morning sky, like a menacing enemy from another universe.

CHAPTER V

Their Reward

ON a broad plain traversed by a sluggish brown river and speckled over with too numerous towns and villages, an expectant hush seemed to fall as the cheerless dawn broke, revealing homes, fields and factories in depressing stolidity under the

lowering gloom of a coppery sky.

Not all the dwellers on the plain sensed the unusual expectancy of the new day, which perhaps, after all, was fearful only in the anxious minds of the few who guessed what the morning might bring forth.

Men were already trailing out from the villages to their day's labor in the fields, or striding more alertly in the larger towns to their work in the forbidding factories. Only the few who knew sat tense and silent in their laboratory offices, dreading and yet hoping. Their night vigil had but sharpened their wakefulness and stretched their nerves to the snapping point. The next two hours would unappealably decide whether their desperate venture had succeeded or failed.

Unable longer to endure the torturing suspense, one of the watchers rose wearily and walked from the central offices of his laboratory into the open air. Although he was not yet thirty-five, his bronzed face was deeply lined and seamed like that of a man of eighty. His many battles against the ignorance and prejudices of his people had left their scars. But he had triumphed over them all. Now, in the hour of doubt, his all hung on the turn of a single card.

He stood motionless in the courtyard of the main laboratory, staring with unseeing eyes at the ugly fifty-story building of glazed red brick and white tile. The thought flitted across his mind that science was like that uncompromising building, hard, cheerless, and unbeautiful. And yet he had deliberately staked the whole future of all his people on science. Had he erred?

In their honorable past, the humblest of his people had worshipped beauty. Would it not be wiser to let the rush and roar of the modern age flash past unregarded to its predestined end, while he and all his people dreamed away their uneventful lives in primeval simplicity? Were the skilled mechanics, hastening now to their daily work of grinding out new luxuries to gratify artificially stimulated desires, any happier than the ignorant laborers who were about to sweat for twelve dreary hours in the fields? The president of the laboratories did not know, and for the moment he did not greatly care. He had touched the nadir of his inborn pessimism.

Suddenly his whole expression changed. He became alert, intensely modern, and a man of deeds. For perhaps two seconds he stood rigid, listening, with all his body, to make sure that his subconscious instincts had not deceived him. Reassured, he dashed back into the laboratory.

"They come!" he cried. "They come!"

Instantly the labyrinths of the laboratory became a swarming hive of excited men and women, boiling up from underground like ants flushed out of their tunnels, and streaming down from the fiftieth story to the first by every elevator, in response to the signal of victory flashed to all quarters of the vast building from the central offices.

The courtyard was already jammed when the president finally succeeded in forcing his way through the milling crowd into the open. All were shouting, gesticulating, laughing, and pointing to a black dot against the copper sky.

There was a sharp report, and the clamoring crowd instantly became as still as death.

"Make way for the president," a pompous voice commanded.

A narrow lane opened, and the president, accompanied by ten of his divisional directors, hastened to the small helioracer parked against the farther wall of the courtyard. In the dead hush the swish of the descending long distance cruiser, as it dropped like a plummet from the clouds toward the landing stage fifteen miles away, became plainly audible. The crowd drew in its breath. Their president and his party were already soaring up to greet the heroes in that dull gray cruiser to welcome them back to their native land.

They saw the racer intercept the descending cruiser in midair. Both came to an instant halt. Then a blinding blue light flashed from the racer, shattering the copper vault of the sky. This was the preconcerted signal of complete victory.

The crowd went mad. All were highly trained scientists or expert technicians. Not since they were children had they given such unrestrained vent to their emotions. The slim racer and the massive cruiser dropped together, neither presuming to take precedence over the other on their descent to the landing

stage. The crowd sighed. They had witnessed the epochal moment in the history of their people.

ON the landing stage, fifteen miles away, a side door of the huge gray cruiser slid back, and a man in the plainest of plain civilian clothes stepped out. This was the chief of the secret service of the nation. As the president of the laboratories hurried up, the waiting man stiffened and saluted.

"You brought all?" the president demanded.

"All."

"How many men did you lose?"

"None."

"And they?"

"One international police patrol cruiser was destroyed with its crew. It was necessary for us to rest some time on the northern Mexican desert, to give the enemy an opportunity of pursuing us. I thought it best to draw their forces, and elude the patrols called out by a general alarm. They will think now that my crew and I have perished."

"You have done well."

"I am honored. The material is here."

The chief turned and beckoned to four men in the hold behind him. The ten divisional directors of the laboratory hastened forward to receive the priceless cargo. Each accepted a carefully wrapped package on his extended arms, and walked slowly back to the helioracer. When the last had safely conveyed his treasure, the president addressed the secret service chief, who stood rigidly at attention. He might have been receiving a medal for valor.

"We anticipated your success," the president began, speaking with precise formality. "With you and your thirty most talented subordinates on this crucial expedition, we at the laboratory knew that we could not fail in our dangerous venture. Your reward will be commensurate with the signal service you have rendered our people."

The chief bowed, and his owner continued.

"Anticipating your complete success," the president declared with a touch of warmth, "we at the laboratories have prepared a simple ceremony in keeping with your victory. It is ready for your acceptance, if you and your thirty fellow heroes will honor us."

Again the secret service chief's hand shot to the salute.

"I understand," he said.

"Do your men?"

"No. I have told them nothing. As chief of the service I was not accessible to questions of any nature."

"Are your men prepared? Would not some of them wish to inform a dear relative—father, mother, wife, or son—of his safe return? Perhaps they would prefer to rest and sleep before we proceed?"

"Sleep will be unnecessary."

"All is in order?"

"All. I have told my men nothing."

"Perhaps you were wise," the president sighed. "And you?"

"I understand. I am ready."

"Then let us go. Everything is prepared. There will be an express here in a few minutes to take your men to the laboratories. Will you come with me, or would you prefer to go in the express? I must see personally that the material is properly distributed."

"I will stay with my men."

"As you wish. We shall expect you in fifteen minutes. There are a few things to be done before we can properly welcome you home."

The president strode away toward his waiting racer. The ten divisional directors were already aboard, each hugging his priceless package. Just as he reached the racer, the president turned suddenly and looked back. The chief of the secret service was still standing where the president had left him. Seeing his superior turn, the chief again saluted, and stood with his out-turned palm to his forehead until the racer had risen and shot westward in a straight line toward the laboratories.

With what might have been a sigh, the chief of the secret service turned and slid back the steel door of the cruiser. Entering, he closed the door behind him, and pressed a button.

"Are the full thirty aboard?" he asked of the orderly who answered the call.

"Yes, sir."

"Order them to prepare to proceed at once to a festival in their honor at the laboratories. An express will be here presently to convey them. They can sleep afterwards. The ceremonies will not last long."

"The men are exhausted, sir."

"Poor fellows! Tell them it will soon be over."

Without further comment the orderly saluted, turned on his heel, and disappeared. The moment the orderly was gone, the chief of the secret service quickly unbuttoned his shirt and unfastened a small platinum locket which hung by a chain about his neck. Opening the locket, he gazed long and thoughtfully at the miniature which it concealed. The delicately pencilled eyebrows, the sweet smile, and the wistful eyes of the ten-year-old girl's face held him entranced.

FOR a moment he seemed to hesitate between patriotic duty and human nature. His lifelong training overmastered his natural instincts. He was a well disciplined man. Since the age of five he had faithfully accepted and unflinchingly obeyed the dictates of his superiors. Militarism and all its fanfare had all but vanished from the earth fifty years before he was born. Its flaming spirit, however, still smouldered. The leaders of his people well knew that in order to get a service done without question and without cavil, it was essential that a servant's spirit be broken before it had discovered its wings.

With a last longing glance at the beautiful young head, the chief of the secret service pried the exquisite little miniature loose from its platinum bed. Then, setting his teeth, he dropped it onto the steel floor and ground it to powder under his heel.

"Pro patria," he said, as he had been trained to say. "Farewell."

He rose, and strode out, onto the bridge. He did not dream that he was a fool.

"Get the men forward. The express is coming."

Two minutes later he and his thirty men were aboard the express which was to waft them to the festival of honor. Within a minute they would hear themselves acclaimed as the heroes and saviors of their nation. They were dead tired, and longed only for sleep.

The president's racer had preceded the heroes by several minutes. The wild clamor and frenzied exultation which had sped the racer's departure were now strangely cold. Eager, nervous hands grasped the priceless packages in tense silence. The divisional directors supervised the unwrapping in the central offices. Coldly, impersonally, they verified the claim of the chief of the secret service. The check was finally passed by the head inspector; the chief had indeed secured all of the desired material.

Sharp orders rang out, and scores of technicians, alertly as troops on parade, sprang forward to do their duty. There was a curiously military tinge about the whole organization. Although the vast armies by which the nation had first forced its claim to a voice in the modern age had long since perished by gas, flame and plague, their immortal heroïsm and self sacrifice still permeated every department of the public service. There was not a man or woman in all that eager throng who would not willingly have laid down his or her life for the common good. In the words of a prominent minor poet of the prescientific age,

"Theirs was not to question why,
Theirs was to do and die."

That human beings can still be found who adhere to such a creed is one of the major stumbling blocks before the solution of the great problem. The president of the laboratories recognized this, as clearly as does any modern, and he regretted it. But he was a practical man. Never did he scruple to pollute his feet by taking the straightest, foulest road to his desired end. The president of the laboratories was great because he knew his own weaknesses.

At last the foremen and forewomen had assimilated their instructions. Work was to begin immediately, and there was to be no rest until the tasks assigned were finished. Physicists, chemists, biologists, metallurgists, mathematicians —all branches of the public service of the nation, were exhorted in half a dozen brief, cutting sentences to do their duty and to prove themselves not unworthy of the men who had placed the key to national supremacy in their hands.

"We are a patient people," the president concluded. "Let your quick fingers and your keen minds end our patience for ever. We have waited long for our heritage. It is in your hands. Let this be an end to patience and humility."

Barely had the last worker silently

departed when the heroes of the day of glory were announced. For a moment the deep lines of the president's face seemed to harden and grow deeper, and his eyes became haggard. Straightening his shoulders, as must all public men in a crisis, he faced about to welcome the chief of the national secret service and his thirty intrepid followers.

They stood at attention in the bare reception room, the thirty, like cattle in a slaughterhouse. All were weary to the point of collapse, and not one gave a thought to the formal ceremony which was to enshrine him forever among the heroes and demigods of his people. All they desired was sleep.

THE chief of the national secret service stepped forward and saluted.

"We are here, sir."

The president slowly returned the salute. His hand might have been moving upward through cold honey.

"The ceremony will be short," he said. "Command your men to file into the reception room on the right. I will address them there."

The chief rapped out the necessary order, and the men filed past in a dream. The chief and the president were alone.

"I will address them from the balcony," the president said.

"I understand. One white, one red."

"Is there any message of a private nature you would wish me to convey?"

"My wife is dead, as you know. My daughter—"

"I know. She is just ten. She is already provided for. I personally am responsible. The State will be her generous father."

Again the chief saluted. He was a trained man, broken to the iron service of his country when he was five years old. To revolt against the inhuman barbarity of his sentence would have been as impossible to him as would the refusal of water by a man dying of thirst.

"You have done well," the president continued. "Had you been so minded, you might never have returned. You might well have squandered your life in idle luxury where your people could never touch you. I salute you! Your daughter shall be our care; she shall not want."

The chief of the national secret service passed into the sound-proof reception hall to share with his men the honors showered upon them for their heroic flight. He closed the metal door behind him.

The president did not even have to move to deliver his address. It had been thoughtfully provided for. Two bulbs, a red and a white, temporarily installed on his ironite desk, would speak for him in the sound-proof reception hall. When he had spoken, the bulbs would be removed, and a picked dozen of trusted collaborators, all in the first rank of science, would clear the reception hall.

He tapped a gong at his left, and waited. A pure white light glowed softly. Deadening the gong, he paused a full ten seconds before again tapping it, twice. A sullen red light flashed out angrily, and died.

Twelve white-faced men entered.

"Is it done?"

"Yes. Cremate the bodies. See that the cruiser is destroyed before noon. Incinerate everything. Be particular about the heel. It must be reduced to dust."

The twelve padded silently from the room to gather up thirty-one limp men who had forever forgotten the art of speech, to consign them to the swift, withering blast of an electric furnace. The daring adventurers had earned their reward.

CHAPTER VI

A Modern Morning

WHILE Hardinge was shooting low over the desert toward Los Angeles at something between five and six hundred miles an hour, Merriman and Dakan plodded slowly up toward the highest ridge, nearly a mile distant from the Observatory. They spoke but little. Each guessed the other's gloomy thoughts. Conversation while climbing at their present altitude being quite a luxury, they thought in silence.

If, as Dakan had feared when Hardinge first told him of the theft, the plates were to fall into improper hands, it was almost a certainty that the great work on which the Observaory was secretly engaged, would never be com-

pleted. The obvious information, which any competent physicist could decipher from the hydrogen-helium analyses, would deceive all but the keenest readers of nature's secrets into false dreams of sudden wealth—and irreparable disaster. Was it likely that men of the first rank in science had sold themselves to some unscrupulous corporation, to work out their lives in obscurity? It did not seem probable, and yet some man of at least the second rank on the Mountain had done about as much. The very nature of the theft was its most baffling feature. Either the thief was totally ignorant of the most important secret hidden on the plates—which seemed unlikely, in view of the high-grade of all the workers on the Mountain; or, what was infinitely more disturbing, the thief had taken the plates with full knowledge of their potential evil, on the insane chance of enriching himself and his accomplices at the expense of the entire human race.

Equally to be dreaded was the high probability that the thieves, in their ignorance, would attempt the complete hydrogen-helium transformation prematurely and destroy civilization in one white blast of uncontrollable energy.

Merriman had no immediate plan of action to propose. He held his tongue, and plodded steadily up the steep incline toward the giant tripod. If by evening the world police—every civilized country had been warned to keep a sharp lookout for the bandit plane—had found no clue, they might safely assume that the plane had reached its destination and would never again be heard of.

As they stepped onto the flat rock platform supporting the giant tripod, Merriman turned to Dakan.

"That climb did me good," he began. "Do you know, I think it would be a wise plan to transfer Yandell to one of the strictly physical laboratories—say in New York, or London. It really makes no difference which of the whole forty he chooses. For all I care he can go to Calcutta, or Pekin, or Cairo, or Teheran, or even Buffalo."

Dakan stared. "Why?"

"Oh," Merriman parried, "his real bent is toward metallurgy, and he can do that about as well away from the Observatory as actually at it. He can have whatever astronomical data he needs sent to him. In fact, we might appoint an assistant to do his observing for him. The transfer would then be in the nature of a promotion. With a corresponding increase in salary, of course."

"But Hardinge is not sure of Yandell's innocence," Dakan protested.

"Nor am I," Merriman rejoined, "as I really think things over. You believe he is too stupid to have a hand in this. Perhaps he is; I don't know. At any rate, we shall never find out anything so long as he stays on the Mountain. His alibi, as I see it, is perfect. He has purposely made a nuisance of himself over the supplies. Every woman on the staff is convinced that he is just a natural busybody. That explains his presence in the supply depots, where the plates must have been loaded onto the plane. So, all things considered, I think he has earned a promotion."

"I see," Dakan agreed. "It would be out of the question to bring detectives onto the Mountain—"

"Unless we changed a bedmaker or two," Merriman suggested.

"It wouldn't do. The thief would know at once what the newcomer was. What better could he ask? To be shadowed after the theft would rather amuse him, I should think. No; your first plan is better. If Yandell does know something about this that he shouldn't, it will be the easiest thing in the world to set secret agents onto him in some city. I only wish," he concluded with a rueful smile, "we knew what other promotions to make."

"So do I," Merriman agreed. "Perhaps Hardinge will have some suggestions. Well, here's the first of the new focalizers almost complete. Let us forget that wretched business for half an hour, and enjoy ourselves inspecting. I've brought my field glasses."

FOR a full seven hundred feet the webbed steel legs of the massive tripod towered up from the bare rock, where they were securely anchored fifty feet below the polished surface. Stepping back a few feet and glancing up, Merriman noted with satisfaction that the lens was already mounted on massive universal joints at the very top of the tripod, and evidently ready for use.

"You've made a quick job of it, I see," he remarked warmly.

"Fairly. I thought we had better speed things up a bit," Dakan replied. "My next plate, about three months from now, should give us all the data we need. I acted on my own responsibility, and ordered the engineers to double the crews."

"Quite right. I hardly expected a pleasant surprise like this when I left London yesterday evening. Everything done except installing the motors?"

"Practically. They still have to mount the lenses on five of the new towers. The chief engineer told me two days ago they hoped to mount them today."

"And the local fly isn't available," Merriman lamented, like a small boy done out of a visit to the circus. "Why did I advise you to let Hardinge go to Los Angeles? I've wanted for months to see them drop one of those things into place."

"Never mind," Dakan smiled. "Four of the five unfinished towers are over a hundred miles away—"

"Where's the fifth? In range of my field glasses?" Merriman excitedly handed his binoculars to Dakan. "Show me where to look."

Dakan took the glasses and turned East.

"Over there," he said, pointing to what looked like a crimson splinter piercing the blue-black sky. "On that red needle sticking up about five miles to the northeast. You can even make out the details of the structural steel of the tripod through these glasses. Have a look. The workmen should be there, if they are coming today, in about twenty minutes."

Merriman located the distant tripod. "I've got it! If the crew doesn't show up in half an hour I've a good mind to go back to the Observatory and ray the chief engineer to put on a special show for my benefit. It isn't often that I get out here, and I need some mild relaxation."

The staid chief of the whole vast organization was as excited as a five-year-old at the prospect of witnessing what, after all, was no very difficult feat of engineering. Only its performance in those utterly barren surroundings, with the shimmering desert over two miles below staring up white and blind at the vast blue above, lent the spectacle a certain glamour. As the sun rose higher, the restless winds of the desert came to life, and swaying curtains or whirling pillars of glistening salt and gleaming borax dust, thousands of feet high, unwound the stately evolutions of their daily dance over the desert floor. As the fleeting pillars passed along the eastern precipices of the valley wall to their far escape toward the north, their tumbling shadows sped over the utterly barren foothills, or gesticulated grotesquely along the high, parched cliffs, blotting out the glare of naked scarlets and blinding yellows in racing patterns of inky cobalt blue.

Rather overpowered by the sight of nature in action in her least compromising mood, Merriman turned his back on the desert, and sought comfort for his human self-importance in the very substantial tripod.

"Let us have a look at the motor chamber," he suggested, preceding Dakan down a broad stairway hewn in the living rock. "Are the motors for this tower installed yet?"

"I think so. There was a crew working on this platform early yesterday morning."

Some fifty feet down in the solid rock they found the operating chamber, already brilliantly lighted by the perpetual white glow from a single quartz globe. The spacious room was silent and as cool as the unrifled last sanctuary of some forgotten Pharaoh. A glance showed that the motors for driving the gears, cunningly installed in the legs of the tripod, for tipping the massive lens, seven hundred and fifty feet above the controlling switchboard, to any desired angle, were already installed.

Stepping over to the operator's desk, Merriman depressed a tiny switch. Instantly a smooth murmur of perfectly meshed gears hummed on the air, and a quartz button on the desk glowed red.

"It's in full working order," Merriman exulted. "Do you mind staying down here and throwing the switches while I run up and have a look at the lens tipping?"

"Go ahead," Dakan laughed, amused at the older man's excitement over his latest scientific toy—although it was by no means a mere plaything. He reached for a charted monogram, glanced at his wrist dial, and quickly found from his

chart the coordinates he sought. "I'll tip the lens directly at the sun," he called up after the departing Merriman. "It should go over into position in three movements. Watch for them."

Waiting till Merriman's thin shout echoed down to the operating chamber, Dakan carefully set the scales. Then, depressing three switches, he waited, while Merriman, as happy as a boy playing hookey, stood peering up at the faultless performance of the lens.

AS Dakan had promised, the huge lens—a mass of solid, chemically pure lead forty feet thick and two hundred feet in diameter—tipped noiselessly over in three silent, perfectly adjusted movements, until its slightly curved upper surface, like a huge, blind eye, stared directly into the dazzling face of the early morning sun.

In all, fifty such gigantic focalizers, each with its massive lead lens, stood like silent sentinels at strategic points on the highest peaks of the barren ranges emprisoning the desert. Not all were of the same dimensions as the one at which Merriman was now staring up in delighted admiration. A few were smaller, the majority much larger; the colossus of them all, towering up in solitary strength fifty miles from its nearest fellow, supported a lens of lead over a thousand feet in diameter.

Between them all, the lenses of that giant army could sweep the whole vault of the sky in a concerted foray for the hard radiations which they sought, or be directed as one fifty-fold eye toward that quarter of the heavens from which the intensely penetrating rays streamed most abundantly. Night and day, year in, year out, age after age, since billions of centuries before our sun was born, those hardest of all known radiations had been shooting their keen arrows, keener than light, through void space and vast clouds of interstellar dust so deep that the unslackening rays took millions of years to traverse them, to fritter out their boundless energy in utter wastage and the tenuous beginnings of new stars at the very limits of the universe. And now a handful of men and women were about to tame that ungoverned energy and direct it to human ends, as, in the rapidly fading past, the major prophets of the human race had broken the spirits of fire and electricity, to make of them common menials.

Would the new energy, when finally broken to human use, prove as docile a servant as had fire and electricity? Only laboriously cautious experiment could decide. Within four months at the longest, Dakan would have completed his last three-hundred-hour survey of the invisible heavens, and a first, tentative setting of the whole battery of lenses toward the most promising quarter of the sky, would be feasible. Working from that carefully calculated beginning, the leaders in the great research hoped to be able to predict within two years whether the new energy should ultimately prove a blessing or a curse.

The echo of a distant shout sent Dakan bounding up the stone stairway to the platform of the tripod. Merriman had detected the hum of an approaching fleet of helio-freighters. They swam into visibility just as Dakan reached the open air. Preceding the main fleet of fifty huge freighters, a compact company of five swift cruisers advanced in wedge formation toward the eastern rampart of the mountains.

"Those are the engineers' planes," Dakan remarked. "Watch—one is shooting ahead toward your crimson splinter. Get out your glasses—quick!"

Even without glasses in that absolutely clear air, it was possible to follow the main evolutions of the fleet and the delicate operation of mounting the lens on the nearest tripod but five miles away. What Merriman admired through his glasses in silent fascination was undoubtedly, even the more sophisticated Dakan admitted, a brilliant specimen of modern engineering technique.

The engineer's plane which had shot ahead of its four companions, zipped swiftly up to a spot in the hard blue a full mile above the uncapped tripod, and hung there, apparently motionless, like a humming bird above a flower.

"The engineer in charge raying orders," Dakan commented. "Watch the freight fleet."

Even as he spoke, the ten last freighters of the fleet of fifty slackened their speed, and the remaining forty, preceded by the four engineering cruisers, sailed swiftly, steadily on, past the tripod, seeking their respective jobs of the morning.

What followed, happened in less than five minutes. As the ten huge freighters roared over the spot where Dakan and Merriman stood, they slackened their speed and slowly, with perfect precision, spread into a flying circle that maintained its exact conformation while still advancing steadily toward the uncapped tripod. As the flying circle swam overhead, the observers saw at least one reason for the extreme precision of that marvelous flight. From each of the ten freighters two stout steel cables, about fifty yards long, were attached to a huge solid disc of shining lead at equal distances around the circumference.

"There's the lens," Dakan cried. "Now, if all the motors were to stall at onee—"

"They won't," Merriman prophesied confidently. "Not one has ever balked before it was worn out."

The crews of the freighters began paying out more cable in perfect unison. A yard at a time the five hundred foot lens dropped gradually lower, and the flying ring widened perceptibly as it drew nearer the tripod. When within half a mile of it, in response to an order rayed from the engineer in charge, the advancing ring came to an abrupt halt and, with its tremendous weight of lead, hung suspended and motionless, like an enormous paraehute, for fully five seconds. Then, obeying a second order, it soared vertically upward, till it reached a station about a thousand feet lower than the engineering cruiser, and again came sharply to rest. A third order sent the ring into swift, accurate motion in a straight, horizontal line, directly toward the void above the tripod. Again it came to rest, this time a thousand feet below the engineer, and about four thousand above the tripod. It was now in position for the last, delicate manoeuvre. Its great height above its objective gave the ring ample opportunities for minor adjustments.

THE next order caused the perfectly balanced ring to descend swiftly, until the suspended lens hung about fifty feet above the waiting arms of the tripod, when once more the ring rested in mid-air. Simultaneously, the engineer's cruiser swooped down a ten-degree incline and came to rest in the air on a level with the top of the tripod. Evidently the lens was not in the exact position for the final lowering. The supporting ring rotated slightly, bringing the huge pins of the supports of the lens directly above the sockets which were to receive them. At a final order, the ring dropped slowly down the last fifty feet and, lightly as a feather, deposited the five hundred foot lens of lead in the sockets of the tripod. Ground mechanics would finish the job the same afternoon; the real work was done. The ten freighters cast off their cables, took up their positions in close flying order, and followed the engineer's cruiser baek toward the distant city.

"Well, I can sleep after that," Merriman sighed, putting away his binoculars. "If only the men on the Mountain were as reliable as the mechanics in those freighters, I shouldn't worry about anything on earth."

"If they were, you would have missed seeing the show over there."

"True," Merriman admitted. "And, good as the show was, I doubt whether it was worth the price of admission. Those wretched plates! Why will people steal stuff they can't possibly understand?" Dakan made no reply, and Merriman continued. "There's no use fretting till Hardinge returns. I'm going to bed the minute I reach the dormitory. And you had better do the same."

Reaching the living quarters, they parted for the day.

"I suppose we may expect him back by dinner time?" Merriman asked.

"Yes, unless he finds something really important in Los Angeles. I'll leave a note for a call in case he returns earlier. If there is anything worth reporting, I shall get you out at once."

"All right," Merriman responded sleepily. "Goodnight—or rather good day, I suppose."

CHAPTER VII

Pobby Reports

AT three o'clock that afternoon, Dakan was routed out of bed by a call from Hardinge. Having had about seven hours' sleep, he felt thoroughly refreshed. After a hasty

shower, he shaved, slipped into clean clothes, and went over to the visitors' dormitory to find Merriman. The older man, up and fully dressed, was calmly reading a classic French love story.

"I only need about six hours' sleep at my age," he explained, seeing the surprise on Dakan's face. "No; I haven't been using the radiophone. Anything new?"

"Hardinge is back. He sent for me to go to his cabin, where we can talk without exciting suspicion. I thought you had better come too."

"Of course, if you wish it. But I'm perfectly willing to wait until you and he have threshed things out between you. You're the Director; I'm only a visitor."

Dakan understood perfectly the spirit of Merriman's offer. Deeply touched, he hurried his chief off to the conference without a word.

Hardinge greeted them warily—there was no other term for his guarded friendliness. Having made them comfortable, he told his story.

"Let me give you the end first," he began. "I'm afraid I have drawn a blank."

"But you are not sure?" Merriman interrupted quickly.

"No, I am not," Hardinge confessed. "That is why I'm not more enthusiastic than I am. The Los Angeles chief of police seems to have done everything possible. The men on the milkplane are above suspicion—as we thought all along. Their testimony stands unshaken under the severest cross examination by the best lawyers in the State. They *were* forced down and robbed, as they asserted and, what is vastly more important, they had no knowledge of the dangerous cargo they were carrying.

"The pilot," Hardinge continued, "seems to be fairly intelligent. It was he who had tried to reproduce the sound uttered by one of the holdup men when another dropped his end of the packing case. The professional linguists from the University could make nothing of it—they persist that it must have been a mere grunt of exasperation. Certainly it did sound like that and nothing more when the pilot imitated it for me."

"Have you ever heard one like it?" Dakan asked.

"That," Hardinge said, "is precisely where I hesitate. Sometimes I think I have, and then again I am not sure."

"Where did you hear it?" Merriman demanded quietly.

"Need I say now? Suppose I am mistaken. Then an innocent man's character is jeopardized."

"I don't see it," Merriman objected. "If the man is indeed innocent, he can prove his innocence, and no harm is done."

"Not at all," Hardinge retorted with some heat. "Give a dog a bad name—You must see my point. Moreover, the fewer blind trails that we start on, the sooner we shall reach the end of the right one."

"Then what do you propose to do?" Dakan asked, somewhat puzzled by Hardinge's attitude.

"The obvious thing. Exasperate every last man on the Mountain when he is off his guard, and listen to what he says. I shall begin this evening, as soon as they sit down to dinner."

"Hasn't it struck you," Merriman objected, "that the men in the plane may have been of a different nationality from their confederate here?"

Hardinge's eyes glowed. He beamed on Merriman with open admiration.

"It has," he acknowledged. "But not so different as one might reasonably suppose at first. Some alliances in an affair of this kind are so unlikely as to be almost impossible. Therefore we can eliminate two thirds or more of all the staff at once."

"Which two thirds?" Dakan interposed.

Hardinge's cool reply caused them to stare at him incredulously.

"All those," he declared, "who are not afflicted with an inferiority complex."

"Surely you are joking?" Merriman protested.

"If so," Hardinge declared emphatically, "the joke is on me. Unless my deductions are utterly wrong, the guilty man on the staff suffers from an extremely exaggerated inferiority complex. That alone will provide a reasonable motive for a man of his mentality descending to a theft of this character. Think it over, and you will see that I am probably right."

THEY did think it over, in silence. Hardinge's hypothesis was at least not absurd. What would such a man, ob-

sessed by a not wholly just sense of his own unimportance, and suffering from an incessant hunger to overcome it, do in the face of a temptation which, if yielded to, would make him an object of the highest importance? The tables would be turned: those whom he had formerly envied and tried to equal, would be his contemptible, baffled inferiors. Openly or in secret he could gloat over their abasement, and see himself the master and superior of them all. His complex would be resolved. Such was Merriman's and Dakan's interpretation of Hardinge's peculiar theory. Whether it was Hardinge's own, that astute reasoner considered it unnecessary to divulge.

"You do suspect Yandell, then, after all?" Dakan asked.

In spite of the seriousness of the discussion, Merriman could hardly repress a smile. Pobby's numerous attempts to recapture the first fine frenzy of his boyish precocity were reposing at the moment, unread in their several pigeonholes, in Merriman's London office. After the first glance, Merriman invariably consigned Pobby's numerous schemes for improving the Observatory and running the universe in general more efficiently, to a carefully indexed cold storage. He dared not file them in the wastebasket, as Pobby had the bad habit of referring casually in his personal letters to "Communication No. So-and-so," and it might conceivably be necessary some day to consult the voluminous document in question to avoid awkward inquiries regarding its fate. If any man on earth suffered from a hypo-inferiority complex, P.O.B. Yandell was the victim. His whole life was one futile yell to make others believe what he himself secretly disbelieved, namely, that he was a genius of the first rank.

"Yandell," Hardinge replied gravely, "qualifies on the score of his unfortunate manner."

"But you don't feel," Merriman suggested, "that he is a serious suspect—on other grounds?"

Hardinge's reply was a noncommittal grunt and an expression as utterly blank as his intelligent face could accommodate. Merriman was still in the dark.

"You are holding something back?"

"Nothing of any real importance, I believe. I got the exact location of the holdup from the Chief of Police, and ordered our pilot, on the way home, to circle it and crisscross it, flying at about twelve feet. The footprints were of course still as fresh in the alkali dust as when they were made. I was on the lookout for a scrap of paper, a rag, or anything else that might have been dropped or ripped off in the rush. There was absolutely nothing, so far as I could see."

"It's a wonder the police didn't think of that," Dakan remarked.

"They have, by now. I sent them a message, the moment I returned here, to search every inch of the ground. It is just possible that there may be some telltale shred of cloth, or wood, or paper. There always is," he concluded dryly, "in the case of common criminals and commonplace crimes. Neither description fits in this case. I shall be agreeably astonished if the police find an atom of anything but alkali dust. This job was planned and carried out by experts. Well," he concluded, "I must get a nap. I'll see you at dinner, and open my campaign of getting on people's nerves then."

As they strolled toward the clubhouse, Merriman and Dakan exchanged confidences concerning their somewhat reticent friend. They agreed that he was within his rights in not speaking out his whole mind, as it would be easier in the end to retract a little than to take back a lot. Their final opinion was that his supposed clues would probably lead to a blind alley. Dakan himself had evolved another plan of attack, but as this demanded considerable patient waiting before it could be put into action, there was no need for discussing it at the moment. It had the great merit of being sanely practical and, provided it was not too long delayed, almost certain of success.

Instead of taking a nap when his friends left, Hardinge, having shut the door, unlocked a large drawer in the desk in his sitting room, and extracted a massive volume that at first glance might have passed for an exhaustive dictionary of the English language. He had not considered it necessary to tell Merriman and Dakan that nearly an hour of his brief stay in Los Angeles had been spent in shopping. One of his purchases was the enormous tome which he now laid on the desk in preparation for detailed study.

The gold lettering on its cover proclaimed it to be *The Complete International Guide to Helioplane Parts.* His other purchase was a pocket motion picture camera, with a capacity of five hundred feet of thread-like film which could be almost instantaneously developed and then enlarged by cylindrical projection to any convenient size. Both purchases were planned before he took off from the Mountain that morning for the flight to Los Angeles. On the return trip, while the pilot was crisscrossing the scene of the holdup, Hardinge had unobtrusively photographed every square inch of three particular spots, which he had expected to see, and which at once riveted his gaze as the pilot dropped to the fifty foot level.

ON his return to the Mountain, he had gone at once from the landing platform toward his own cabin. The trail skirted the side wall of Kate Douglas' cabin. No one was in sight. Confidently expecting to find Kate awake and anxious, he tapped gently on the side door. He was not deceived. The door opened instantly; Kate had seen him coming.

"I saw you leave in the racer this morning," she explained, as Hardinge slipped in; "and I haven't slept a wink since. Where have you been?"

"Never mind now. Hurry with this." He handed her the tiny roll of film. "Go down to the photographic laboratory and develop this at once. Don't let anyone touch it. If one of the boys offers to help, tell him it is something special, and you want to do it yourself. Bring it to my cabin when you finish. The front door will be ajar a few inches. Just toss it in as you walk past. You should be there inside of half an hour. Don't leave here until I'm out of sight."

Twenty-five minutes later Kate, ostensibly on her way with Ruth Troland to their usual afternoon tennis, passed Hardinge's cabin and deftly tossed the developed roll into the living room. Hardinge was waiting. Pocketing the film, he walked to the local radiophone and told the general office to inform Dakan that he had returned. He then sat down to wait for Dakan, shrewdly suspecting that Merriman also would come.

The situation was clearing up rapidly in his mind. As yet he saw no hint of a solution, but he did grasp the essential facts clearly. All irrelevant details were almost automatically discarded in the processes of his orderly, disciplined thinking. The Los Angeles Chief of Police had laid before him a succinct digest of the complete reports of the International police, both air forces and land forces. Not a trace of the bandit it must have entered the United States by some route well off the traveled airlines, and have left by a similar way. This, on its face was a most probable hypothesis, even without the confirmation of the world's police forces.

The men of both the Boston express freighter and the milkplane agreed that after the attack the bandit plane fled directly toward the Mexican border. In the line thus taken, the fleeing plane would pass for hundreds of miles over uninhabited deserts not spanned by any of the trans-continental air routes, all of which lay far to the north of the border. It seemed likely that the plane had entered by approximately the same route. Whence had it originally started, and where was its home destination? That was the problem which Hardinge set himself. Naturally, the South American Police had taken extra care in their search. Their report was as blank as the others, although they admitted that vast expanses of the mountainous and jungle river areas of their continent were but rarely visited by the air police, and then only on the slim chance of picking up some foolhardy low-level crew that had come to grief while attempting a short cut or an adventure. There was still one cruising plane to be heard from, however, and it might not return to its base for three days. Attempts to ray it had failed.

Hardinge's speculations were terminated by the arrival of Dakan and Merriman. The moment they left, he resumed his analysis, this time more systematically with the help of his huge *Complete Guide* and the tiny roll of developed film. Turning the pages rapidly, he scanned them at a glance. Thus he passed the time, pleasantly enough, feverishly smoking one cigarette after another —to the imminent danger of the uncoiled film—and waiting impatiently for the dinner hour.

Arrived at the club house after leaving Hardinge, Dakan and Merriman sought the quiet solitude of the chess room. They had barely set up their

pieces, when the aggressively affable Pobby stuck his nose in.

"How do you do, Mr. Merriman?" he inquired officiously, pumping like mad at the abashed "big chief's" hand.

"I'm very well, thanks, Mr. Yandell. How are you?"

Pobby lowered his voice. "Can we speak privately here?"

Merriman nodded indifferently. "Shut the door, will you please, Dakan?" He turned to the bursting Pobby. "What's on your mind?"

For once in his life Pobby seemed embarrassed. He actually reddened behind his neat golden beard.

"I guessed this morning when I heard that you were making a special trip here, that only some matter of extraordinary importance could cause you to abandon to subordinates the affairs of the London office."

Pobby orated in well chosen phrases, as if he were on a platform before an admiring audience. In his enthusiasm he failed to note the calmly appraising look in the eyes of his hearers.

"And now," he went on, lowering his voice to a dramatic whisper, "I have guessed the reason for your very fortunate visit."

"Indeed?" said Merriman. "You are a good guesser, Mr. Yandell."

"Oh, I just use my eyes. If Mr. Dakan will pardon me for saying so, there has been a deplorable laxity of late on the Mountain. Not," he hastened to explain, "that Mr. Dakan is in any way responsible. He cannot be everywhere at once. And even he, great as he is, is only human. Even our all but superhuman Director requires a certain amount of sleep."

"Go on, Yandell," Dakan encouraged dryly. "Break it like an egg. What vestal regulation have the cooks violated now?"

"I regret to say," Pobby confessed, "that it is certain members of the staff who are delinquent. The kitchens and supply depots are functioning perfectly."

"This is serious," Merriman commented with a mock gravity which Pobby took for the real thing. Pobby was flattered by the big chief's apparent perturbation. "What is the charge, Mr. Yandell?" Merriman inquired blandly.

"It is extremely distasteful to me to be forced to report. Properly, the Director should shoulder the responsibility."

"All right," Merriman agreed. "You tell him, and I'll listen in."

DAKAN had a sudden qualm as Pobby, with perfect sobriety, faced him to follow out Merriman's suggestion. Was the man such a complete fool as he seemed to make of himself. For the first time in their years of mutual dislike, Dakan began to suspect that Pobby after all might have a tongue and a mind of his own.

"Mr. Dakan," Pobby began, "you will admit that the strictest regulation we are subject to, although it is an unwritten one, is that which forbids the mixing of the sexes while on duty on the Mountain?"

"Well, what of it?"

"Simply this, Mr. Dakan. Miss Douglas and Mr. Hardinge have disobeyed the unwritten law."

For a moment Dakan could say nothing. Merriman dived for his handkerchief and hastily smothered what might have been a sob, but sounded like a snort.

"How the devil do you know?" Dakan demanded. For the first time in his life he was thoroughly angry with this prying little man who took so much upon himself. What if Kate and Hardinge did like one another? Whose business was it but their own?

"I know," Pobby declared unctuously, "because I saw Mr. Hardinge coming out of the side entrance of Miss Douglas' cabin."

"When?" Merriman asked with deadly indifference.

"Shortly after Mr. Hardinge returned from Los Angeles this afternoon. I was unable to sleep after twelve, and happened to be reading by my window."

"Do you ever sleep?" Dakan asked acidly.

"Not when there is important work to be done," Pobby retorted with dignity.

"May I ask," Merriman inquired, "whether the book you were reading was interesting?"

"It was rather dull, Mr. Merriman. I fear my attention wandered too frequently."

"Hm. Life versus literature; I see. Well, Mr. Yandell, I lean that way my-

self. So you have inferred that my visit is for the purpose of scotching the snake of promiscuity before it bites somebody?"

"I wouldn't go so far as to call it open promiscuity," Pobby replied judiciously; "although I did name it that, I believe, in my last report to you."

"I fear I have not yet had time to read that one," Merriman confessed.

"But I sent it to you six weeks ago," Pobby protested indignantly.

"Ah, yes, I remember now," Merriman prevaricated hastily. "The word did occur in your last report. Doubtless my subconscious recollection of it was the real reason for my sudden decision to make a tour of inspection. Now, Mr. Yandell," he continued soberly, "I think this is as good a time as any to speak out something that has been on my mind a good many months. Your painstaking and detailed reports have impressed me greatly." Unconsciously, as if hypnotized by his victim, Merriman was rapidly swinging into the stride of Pobby's most athletic rhetoric.

"A promotion, I take it, is no more than your just due. Would it be agreeable to you to transfer to one of the greater physical laboratories? Say New York, or Buffalo, or Cairo, or Yokohama, or Pekin, or Paris, or London, or Calcutta?—take your choice. There would of course be a substantial increase of salary—say fifty per cent. In my opinion your metallurgical researches could be more efficiently pursued with greater physical opportunities and closer cooperation"—Merriman used the last word with deliberate malice, as it was one which he detested and which Pobby adored—"with your fellow specialists. The Observatory, I know, will be happy to send you all the astronomical data you may need by fast express helio. Will you kindly give this matter your most careful consideration?"

Pobby pursed his cherry lips, toyed manfully with his yellow beard, and gave Merriman's generous offer his most careful consideration, as requested. His reply caught both of his listeners off guard. They were totally unprepared for its sheer, brazen audacity.

"I should prefer, Mr. Merriman, to be appointed visiting metallurgist at large for all the laboratories. The astronomical phase of my work is completed. For at least a year, possibly for two, I would sincerely appreciate an opportunity for inspecting the work of my colleagues in all of the laboratories and in the national research centres throughout the world. The title of Consulting Metallurgical Delegate might not be inappropriate."

Dakan was about to make a truly fitting reply, when a hasty glance from Merriman checked him.

"No one can say you have not deserved such an office, Mr. Yandell," Merriman intoned. "Allow me to congratulate you on your appointment."

They solemnly shook hands.

"May I announce my promotion at dinner tonight?"

"By all means do. And I shall be only too glad to confirm it before the staff."

POBBY took his leave. At the door he turned back, and looked Merriman straight in the eye.

"You will never have cause for regretting this appointment, Mr. Merriman. Good day to you both."

"Good day," they responded limply.

"What the devil did he mean by that last?" Merriman demanded when the door closed. "For a quarter of a second he looked almost half human."

"I'm beginning to think I don't know him as well as I thought I did. By the way, I suppose there will be no chance of his giving your agents the slip on his world travels?"

"Not the slightest. And he will never suspect he is being watched. I can easily get the best men in the world at that sort of thing. It will cost something of course, but I believe that Yandell will bear watching, even if he is a perfect fool."

"Are you sure he is a fool?" Dakan asked point blank. "He has done some first rate work on metals."

"Oh, his work may be all right. I was thinking of his speeches. Well, he gave us one useful piece of information. Hardinge is holding back more than we suspected."

"Let him take his time. He likes to do things in his own way."

"I'm willing. You're the director. By the way, there is no doubt about Miss Douglas, I suppose?"

"None has ever occurred to me."

"Good heredity, and all that?"

"The very best."

"Then that's settled. Shall we go to dinner? I thought I heard the first signal. It might be a good thing to hang about the sitting room for the next ten minutes and study faces."

Dakan agreed, and they hastened to the dining hall.

CHAPTER VIII

Spilt Soup

THE sun had already sunk behind the high western wall of the desert valley when Dakan and Merriman entered the lounging room of the dining pavilion. The dry heat of late afternoon had given way to a penetrating chill, and the warmest spots of the comfortable lounge were now easily the most popular.

About a dozen men and three girls were sitting around, chatting or watching the daily news reports spring into vivid shapes of solid moving color on the silent telephotoscopes—the vocal variety had long since been banished from the Mountain as an intolerable nuisance. Those present were the men and women who were not compelled, but who preferred, to do about two-thirds of their work by daylight—mathematical spectroscopists, computers, and the like. As Merriman entered, they rose respectfully. He laughingly waved them back to their seats.

"I'm not so old as that, yet, I hope," he remarked to a beautiful young girl of about twenty. "Wait till I'm a hundred and sixty before you think you have to get up when I come in. What is your work, may I ask?"

"Oh, I'm just one of Mr. Hardinge's junior assistants. I do what new mathematics he calls for from time to time."

"Good Lord," Merriman sighed hopelessly. "I see I can't talk to you. By the way," he continued with a twinkle, "if you are good at mathematics, what is the interest on $1719181819.35 at seven per cent per annum, compounded quarterly for 138 years and 11 months?"

"*That* isn't mathematics," she retorted disdainfully, with a slight tilt of her charming nose. Still, if you really want to know, it is—"

"Never mind, my dear. Do you really do that sort of thing in your head?"

"Why not?" she replied, her brown eyes rounding in astonishment. "All regular members of our guild were born with 'that sort of thing,' as you call it. If I hadn't had it as a little girl, they never would have educated me for this profession. But," she concluded doubtfully, "I believe you are just making fun of me."

"I assure you I was not. And, what is more to the point, I don't intend to try. On the whole I think it would be simpler if I were just to sit and watch the pictures and leave you in peace to your meditations. I'm only an ex-banker, you know."

With an old-fashioned bow he left her, and found a seat in a far corner of the room by himself. Dakan was roaming around from one news report to another, apparently on the search for something of interest, but in reality studying the faces and the behaviour of the company. Every few seconds brought fresh arrivals, for the most part night workers glowing from their afternoon exercise.

Presently Merriman's attention focussed on five men. Before one of the larger telephotoscopes the grizzled Brahmin, Bhattacharyya, sat in a dream watching a colorful panorama take solid, moving shape before his halfclosed eyes. Disdaining the frantic speed of the modern age, Bhattacharyya had turned off the current news, to tune in on a simple record of the daily life of his beloved native city—Benares, the shrine of thirty million discredited gods.

In spite of the patient imitativeness of Bhattacharyya's people in really high-grade manufacturing—helioplanes, telephotoscopes, disintegrators and all the rest of the million and one things that more sophisticated nations think necessary—the aloof Indians had retained their ancient individuality. It was at this phase of their life that Bhattacharyya gazed in rapture.

The muddy Ganges, filthy as it had ever been, its dank waters barely moving, streamed slowly past a dilapidated and grotesque temple, its sluggish soup fouled with sewage and corrupt with the floating corpses of dogs and but half-cremated human bodies. From the temple steps the mongrel population descended in reverence to fill their crusted

jars with the holy, filthy water, to bathe in it, to drink it, and, in the majority of instances, further to pollute it by laving their oozing sores.

The modern spirit had not touched the masses of India. Only rarely, as in the case of Bhattacharyya, did India produce a man who could at least parrot the manners and customs of civilized humanity. Within ten years of the final withdrawal of the British, the Brahmins had recaptured the dawning intelligence of the proletariat, and in a single generation India had slipped back to the middle ages. There it still festered, in spite of scientifically-minded world statesmen.

"I wonder," Merriman muttered, watching the dreaming bliss on Bhattacharyya's unconscious face. His gaze travelled to the second of the five whom he found interesting.

Mamoulian, the fleshy Armenian, sat stolidly staring at a dramatic portrayal of the final expulsion of the Jews from Turkey. His own people, two centuries ago, had expelled the Turks, only to find themselves competing with a shrewder race. This was the colorful news of their final victory. Mamoulian did not disapprove.

Merriman sighed. What hope was there of ever solving the great problem while human beings still permitted such barbarism, and positively seemed to enjoy seeing their own kind suffer?

HE turned to the next of the five who had caught his eye. A young Bolivian, rapt before the vivid presentation of the ceremonies of his national flag day, all but saluted the fluttering green and white as it flashed up on the air before him and visibly flapped. The faint humming of an almost forgotten revolutionary anthem buzzed in Merriman's ears. That martial air had made more than one mountain torrent run crimson for a year.

"Hopeless," he said, and turned to the next, a swarthy Central American gloating over the disembowelment of a decrepit old white horse before a cheering audience of some fifty thousand gaudily dressed men and their flowerlike women.

"Bullfight," he muttered. "Not civilized yet. They seem to enjoy it, too. Manly sport. What's next?"

Chou, his face aflame with enthusiasm, was endeavoring to make Wilton understand the sputtering Chinese characters in the common daily bulletin which crackled up in white and red, like an explosion in a firecracker factory, on the quivering space before their eyes. This was great news! China at last had voted free and universal university education —or its equivalent in domestic training —for all of its women living in cities. The last of the republican conservatives had finally been routed by a popular vote of all the city men, who now controlled the major policies of the state. Here at last was progress, slight indeed, but still commensurate with modern scientific advances.

So thought Merriman, till he happened to overhear part of one damning phrase in Chou's excited eulogy.

". . . oldest and greatest nation on earth . . ."

"Oh, hell," Merriman sighed, "what's the use? Same old narrow minded, biggoted braggadocia." Merriman seldom descended to vulgarity. He was moved.

A hand was laid on his shoulder. Glancing upward, he saw Dakan's sympathetic face looking down into his own.

"Cheer up," the younger man counselled. "Pretty bad, I admit. Sometimes I feel like chucking the whole damned job. But we must not give up. If the few can't solve it, the many never will." Then, throwing off his rare serious mood, he rallied Merriman on his pessimism. "You'll get like Pobby, if you keep this up. All that ails you is an empty stomach. Thank the Lord! There goes the dinner signal. They're two minutes late tonight; I must get Pobby to find out who is philandering in the kitchens."

Merriman rose, smiling.

"Hardinge here yet?"

"I think not. After all the excitement he has probably overslept."

They followed the vivacious crowd toward the dining room. Just as they reached the quartz doors, a detaining hand was laid on Dakan's sleeve. Turning, he looked into Kate Douglas' anxious face.

"Join you later," he said to Merriman. "Keep a seat near you for me." Merriman nodded, and Dakan turned to Kate. "What is it?"

"Oh," she stammered, "I'm dreadfully worried about Mr. Hardinge. He is never late, and here it is away past his usual time."

"Any special cause for alarm?"

Kate hesitated. Dakan scrutinized her face closely.

"No," she faltered. "Only I'm so fond of him."

"Then let us go and remind him that the soup is getting cold."

"Thank you so much. I thought perhaps—"

"Yes?"

"Oh, I know I'm foolish. But there must be some criminal hiding here. Whoever it is, he must know by now that Mr. Hardinge, you and I have learned of the theft. Why did Mr. Merriman come? I feel that it was a bad mistake. The whole thing is given away now."

Scarcely aware that they had been running as fast as they could, they found themselves at Hardinge's door. Dakan rang twice. There was no response. The cabin was in darkness. He rang again, insistently. Kate stood by, nervously biting her lips.

"Hadn't we better go in?"

Dakan's answer was to stride into the living room. He turned on the lights. The first thing they saw was Hardinge slumped over his desk. Kate ran to the injured man and anxiously fingered his head.

"Get some water!"

Dakan found a basin, filled it, and carried it to Kate.

"Is he bleeding anywhere?"

"No, thank Heaven." She proceeded to bathe Hardinge's face and throat. Presently the stunned man sighed, and opened his eyes. "He is coming to," she breathed. "See if you can find some wine or something."

"Don't bother," Hardinge muttered. "Silly ass—I mean myself. I'm all right. Thanks, Kate."

His eyes closed, and for a minute they let him rest to recover his strength naturally.

"Give me a cigarette," he muttered, struggling to sit up.

Dakan lit one and placed it between the injured man's lips.

"Feeling better?"

"I'll be back in a moment. Is dinner on yet?"

"Just started," Dakan replied. "Hadn't you better lie down? I'll have whatever you fancy sent over."

"No. Find the brandy. It's in the medicine closet in the bathroom."

As Dakan ran from the room, Hardinge sat up with a great effort and began groping over the desk.

"Do you see that film anywhere?"

"No."

"Look on the floor."

Kate searched, fruitlessly.

"It isn't here."

"Then he got it."

"Who?"

"Haven't the slightest idea. Struck me from behind."

"Didn't you hear him come in?"

"Should have, but didn't. So far gone in my calculations I heard nothing. Quick! before I forget. Take it down."

KATE snatched a pencil and a sheet of paper from the desk.

"Yes?"

"Ten millimetres; four metres; star. Hide that slide rule!"

Just as Dakan entered, Kate succeeded in slipping the sheet of paper and the slide rule into a side drawer.

"Here's a good stiff drink. This will set you up."

Hardinge took the half tumblerful of brandy from Dakan's hand and swallowed it in one convulsive gulp.

"Ugh!" he shuddered. "That should do the trick." He staggered to his feet. "Get me to the dining hall. No! Don't argue. Know exactly what I'm doing. I must see them at dinner! That's it. I'll walk steadily as soon as I get into the cold air."

They let him alone, merely guiding him up the first few steps of the trail. Presently he shook himself together, braced his shoulders, and walked on—or rather slouched, his habitual gait when going up hill—alone.

"Do I act naturally?"

"As natural as life," Kate reassured him lightly. Dakan concurred, but with less conviction. To him, Hardinge seemed to be a grievously stricken man.

"Say nothing," Hardinge warned, "to anybody about what has happened. Tell them I overslept. Leave the rest to me."

"We shall."

Nothing more was said till they entered the lounge, when Hardinge, almost

forgetting his habitual English reserve, all but buttonholed Dakan.

"Now, look here, old man," he begged, "I'm neither cracked, drunk nor crazy. It was only a mild tap on the head that I got. Believe me, I know precisely what I'm doing. What I shall do before dinner is over, I can't prophesy. But whatever it may be, no matter how insane it may seem, count on me. I know what I am about. Remember our talk with Merriman this afternoon?"

"Of course. But don't tire yourself."

"I shan't. Oh, what blessed luck! They haven't started. Let Kate sit with you by Merriman. I see two vacant seats at his right."

"One is for you," Dakan protested. "He heard—"

"Damnation! Please believe that I know what I am talking about."

To the intense astonishment of all three, a vigorous round of applause greeted their entrance. Dakan was about to bow in bewildered embarrassment, when fortunately he saw the cause of the outburst. Pobby was jack-knifing like a prima donna at the farthest table. A second, quicker and more spontaneous storm of hand clapping succeeded the first. This was from the women. They unanimously disliked Pobby.

"What the devil's up?" Hardinge asked.

Dakan briefly informed him of Pobby's "promotion."

"Merriman," he concluded, "has evidently just announced it, and Pobby has made a few rotund remarks. Listen to the women clap!"

"It has saved the soup," was Hardinge's enigmatic rejoinder, as he hurried to a vacant seat at the corner of a long centre table. "Better luck than I deserve. I'll see you later."

Kate and Dakan hastened to the places which Merriman had reserved, while Hardinge seated himself at the corner of the table where Wilton, a Mexican or two, Chou, half a dozen American girls, several South Americans, a miscellaneous handful of Swedes and Norwegians, the solitary negro, the Brahmin Bhattacharyya, and the Armenian Mamoulian, sat patiently waiting for their soup.

This was the Table of the Cosmopolites, as the astronomers ironically called it. Actually it was the last resort of the latecomers. Chou, for one, never seemed to learn the virtues and benefits of punctuality. Wilton, for another, regarded unpunctuality as the one remaining privilege of the pre-scientific age to which he belonged in spirit. The Armenian was too fat to get anywhere on time; the Brahmin was too dignified and much too holy to hustle. The Mexicans and South Americans still claimed all the privileges of "mañana" in their social affairs. They were the habitual laggards.

Just as Hardinge took his seat the soup was served. His friends greeted him with unsympathetic jeers. The girls had decided in private that he was a bit of a martinet with their beloved Kate. Hardinge, as a matter of fact, merely insisted that she get her work done on time. The men at the table were fully aware that Hardinge preferred a seat where he could follow the various athletic contests on the bulletin telephoto-board. Hence he was more than welcomed. They fell on him.

"What's up, Hardinge?" the negro enquired. "Have you given up tennis for tiddledewinks?"

"Almost, Laramie, after the last licking England gave Africa. Tennis is no longer interesting since you fellows went to seed."

Laramie coughed. The all-star team of his compatriots had just suffered a humiliating defeat at the hands of the English "Under-Eighteen" team. Hardinge let him suffer. At the moment he was stealthily engaged in wrapping the loose end of the long tablecloth round his left knee.

In the natural run Hardinge would be served last. When finally the waiter deposited the brimming plate of good old honest Scotch broth before him—bouillon and such light stimulants are eschewed above twelve thousand feet altitude—Hardinge was ready. The broth was indecently rich in barley, small cubes of carrot, parsnip, turnip and potato, and last it boasted at least two stewed leeks per plate. Taking a firmer twist on the tablecloth, Hardinge glanced down the line. The others were either daintily sipping the liquor or struggling manfully with the leeks and richly consorted vegetables. They all knew that Hardinge was a chronic smoker, who seldom got through his broth without at least two cigarettes. They saw him dive

into a side pocket.

"Damn," he ejaculated under his breath, but loudly enough for his neighbors to hear. "I've left my cigarettes at the cabin."

BEFORE a sympathizer could offer his own cigarettes, Hardinge had spilled the soup. It was expertly done. As he jumped up, jerking the tablecloth with him, fully a dozen plates hopped into as many laps, and another dozen, on the farther side of the table, tipped half their rich contents over dainty dinner dresses or white shirts. There was a momentary silence—possibly for a tenth of a second. Hardinge's whole mind and all of his senses were concentrated in that tenth of a second in his ears. The involuntary ejaculations of dismay burst forth from unconscious lips almost instantly. Hardinge listened for one peculiar note, and for one only.

Almost before they knew what they had cried out, the diners recovered their inbred masks of civilized decency. They broke into delighted laughter. Cigarettes were passed up to Hardinge as peace offerings to a god. With chuckling apologies he accepted the sacrifices, and stacked them up beside his plate.

Clean table linen was brought; fresh Scotch broth was ladled out, and the dinner proceeded as usual—or almost as usual. The incident had cracked the ice of whatever formality still froze the strangely assorted company in their social gatherings, and for the first time, perhaps, they met on a common, unstilted level.

Hardinge led the gaiety. They had never suspeeted him of being as young as themselves—as young, that is, as all but the elderly Bhattacharyya and the grizzled negro. Laramie had roared with laughter, showing his primitive mouth with its vivid pink gums and strong white teeth for the first time in twenty years. All that he lacked to make him what he was, and not the artificially veneered scientist he was supposed to be, was a luscious sector of ripe watermelon.

The discomfited Brahmin, on the other hand, tried at first to laugh, but simply could not. The spilling of the broth was, to him, a very real tragedy. Every evening, when the soup was placed before him, he asked what it was, and retired to secret meditation until the dish, if unclean, was withdrawn untouched from beneath his nostrils. The soup tonight contained cow meat, or the juice of it, and was therefore forbidden to one of Bhattacharyya's caste. When the steaming mess now defiled his garments he rose in dignity and stalked from the dining room. They watched him go in silence, knowing that any expression of sympathy would be an insult. Hardinge followed him with his eyes, deeply contrite.

Hardinge's high spirits, slightly forced on account of his aching head, were, he hoped, justified. By a simple process of elimination he had selected his table as the only one likely to give him a clue to the nationality of the men in the bandit plane. His theory had not failed. But had it succeeded? Might it not be a mere coincidence that the men in the plane were, beyond a doubt, of the same nationality as the man who had just betrayed himself by an involuntary exclamation? The two sounds were not the same, Hardinge admitted to himself. But they obviously had their common root in one language.

Hardinge had always liked and respected the man who had unwittingly delivered himself up to suspicion. Perhaps, after all, Hardinge reflected, the man was not guilty. His brilliant intelligence of itself seemed to preclude any stupid criminality. If guilty, this man, like those in the milkplane, was probably only an innocent accomplice. And suddenly Hardinge's eyes shot toward the unctuous Pobby, at the far end of the dining hall. What, precisely, was the life-motive of that obnoxious little insect?

The party was breaking up. Night observers scurried off to coax their instruments into becoming behaviour. Those who should by rights have been day workers, but who preferred to emulate the owl, departed soberly to their cabin studies, and a score of assistants, waiting for their chiefs' orders, hung about half-heartedly, hoping that it was a bad night for nebular exploration.

Hardinge found Dakan waiting for him in the lounge with Kate and Merriman.

"Not working tonight, of course?" Merriman queried. "I've just heard what happened. Could we see you to

your cabin? Or wouldn't it be better to go into town and consult a physician?''

''Oh, I'm all right. Sorry to have made a nuisance of myself.''

''You haven't. Feeling all right? I really think you had better let Dakan call out the racer and spin you to Los Angeles. Miss Douglas can go along to see that you get to a good place. I'll come myself, if you say the word.''

''Really, Mr. Merriman, I'm all right. I've had a great shock, that's all.''

''Was your head injured?''

''I didn't mean that. Whoever hit me must have used something pretty soft. I was 'out' less that an hour. Of that I'm certain. The last time I looked at my dial it was 6:15. That was just before I put away the book I was using, preparatory to taking a bath and shaving in time for dinner. The next thing I knew, Miss Douglas was nearly drowning me in cold water.''

''I just sprinkled your face,'' Kate protested indignantly.

''With a fire hose. But let that go. I heard no one come in, and of course I did not see who struck me from behind. It was a neat crack—aimed to disable, but not to kill or maim. Whoever hit me was an expert. I thought all such experts became extinct in the latter half of the twentieth century. One of our young adventurers must have been reading a history of Chicago or New York in his spare time. Well I'm still alive, although I do have a rotten headache.''

THEY had reached Hardinge's cabin. Merriman was still troubled.

''I'm not asking you to talk now,'' he said. ''But you can answer two questions in a dozen words. First, have you a clue to the theft?''

''Yes. It has given me the shock of my life.''

''Thanks, Hardinge. That's enough of that till you get over your headache. Here's my second question. Are you really all right without a doctor?''

''Of course—,'' Hardinge expostulated. He lurched toward his desk, reeled, and collapsed. Dakan caught him before he struck the floor.

Merriman ran to the dial. ''His skull must have been fractured.'' The response light glowed. ''Be ready in five minutes to fly to Los Angeles. What? You were out once today? This is Mr. Merriman speaking. Hold your tongue! Don't apologize. Hereafter don't argue with anyone who calls you. Get to the landing stage at once.''

With the help of four hastily summoned stewards they got the injured man comfortably aboard the racer within six minutes. Dakan accompanied him.

''Are they set, sir?'' the pilot called.

''Miss Douglas?'' Merriman suggested.

''May I go.''

''Why not? Climb in. When he is fit for it, ask him his opinion of Yandell, and ray me the result. All right, pilot. Go the limit.''

Merriman watched the helio dart into the starlight, and turned disconsolately back toward the dormitories.

''If that man dies before he comes to his senses,'' he muttered, ''we may as well shoot all these domes and towers into the sky.''

CHAPTER IX

Oriental Cockroaches

THE final report from the hospital, received at the Observatory shortly before midnight, was rather alarming. Hardinge had suffered a severe fracture at the base of the skull. It was not yet possible to say how long he would be laid up. Dakan decided to return at once to the Observatory, leaving Kate to keep an eye on things at the hospital. He arrived at the Observatory shortly after midnight. Merriman met him at the landing stage.

''Well,'' he sighed, ''I suppose we can do nothing till the doctors finish with him.''

''Not much,'' Dakan agreed. ''If you want something to do in the next few days,'' he suggested, ''you might arrange for detailed digests of all the daily metallurgical reports for the world to be compiled in the London offices, and have them rayed here every evening.''

Merriman saw the point at once. At the first hint of anything unusual in the metal industries, the police of the world would concentrate on tracing the suspicious development to its source. There

was at least an even chance that any startling new discovery in the metallic arts would be found to originate on the stolen plates. It would only be a matter of a few weeks, Dakan suspected, until the thieves should decipher the invaluable practical applications tied up with the deeper laws in the analyses of the spectrograms. Then, if mere wealth were their object, their first attempt to put the superficial part of the theory into profitable practice would betray them. Dakan hoped that the world police would then be able to recover the plates before their deeper secrets became the private property of an unscrupulous ring.

"I shall see to it right away," Merriman agreed. "What are you going to do?"

"Go on with my work as usual. It is an ideal night for starting another exposure on those nebulae. The quicker the job is cleaned up, the sooner we shall get started on the real thing."

"This is to be your last plate?"

"Yes. Not later than four months from today, and possibly only three, we shall be ready to make a first trial, and learn definitely whether we have really located the proper region of the sky this time."

"Then I had better see about gathering volunteers while I am attending to the other matter."

"I already have the names of about three hundred women who are willing to try the experiment. We are short on men."

"How many will you need altogether?"

"A thousand or twelve hundred. Half for the experiment, and half for the controls. I have only tried privately so far. There has been no general call."

"The controls need not report here, of course?"

"They can live wherever they please, provided some efficient scheme is worked out to keep constant track of them."

"I'll attend to all that," Merriman promised. "You put all your attention on the nebulae. What are you going to do this afternoon when you get up?"

"Nothing in particular. A set of tennis, perhaps. Why?"

"Couldn't we take a spin down to the mines and see how things are going there?"

"Fine. I haven't been down myself for over a year. Shall I meet you at one in the chess room? I shall get to bed shortly after five and be up by twelve."

"That will be just right. Now I'll leave you in peace to your work, and start my own. I have already arranged to have Yandell watched. His first stop will be Los Angeles. I'll bet," he concluded with a broad smile, "our friend Pobby won't see the reception committee."

When Dakan entered the hutch shortly before five o'clock the next morning, he found only the alert Pobby enjoying his lunch.

"Working late tonight, Yandell?"

"Just setting my house in order before taking up my new duties. The racer will spin me into Los Angeles at eight."

"Which of the metallurgical laboratories do you plan to inspect first?"

Pobby poured himself another cup of his pet brand of coffee before replying. His usually smooth brow was puckered as if in anxious thought.

"Really, Mr. Dakan, I have not yet decided. Possibly I shall take a few days' rest before faring forth on my travels."

Dakan could hardly repress a smile.

"You consulted with Mr. Merriman, of course?"

"Oh, of course. He agreed that a rest would do me good." Pobby paused before dropping his bomb. "I trust that Miss Douglas will take good care of Mr. Hardinge."

"What do you mean?"

"One of the stewards told me they left with you in the racer just after dinner yesterday evening."

"Oh, one of the stewards told you?"

"I have come to know them all rather well since I took up the supervision of the kitchens. Pleasant fellows, all of them. They said Mr. Hardinge seemed to be intoxicated, and I noticed myself that he was unusually excited at dinner time."

"You may as well know the whole of it," Dakan replied, "since you have observed so much. Please don't let this go any farther. Mr. Hardinge was not intoxicated. He merely had a little digestive upset."

"But," Pobby objected with quiet obstinacy, "one of the stewards told me he smelt liquor on Mr. Hardinge's breath."

"Why not? He had a cocktail before

dinner. I mixed it for him myself."

"He was feeling tired after his trip to Los Angeles?"

"Rather."

POBBY rose, apparently satisfied. His instinct for gossip was keener than an old woman's in a fishing village.

"Goodbye," he said, extending his hand. "It will probably be many a long moon before I see you again. Thank you, Mr. Dakan, for all your consideration while I have had the honor of being a member of your staff."

Dakan watched him go with curiously mixed feelings of relief, disgust and anxiety. If any man on the Mountain might have known something of the theft, surely it was Pobby with his disagreeable gift for prying. If he had observed anything suspicious in the actions of some member of the staff, why did he not report it? Dakan pondered the problem, and finally rose to dial the operator at the central office. His fingers were already on the dials when he reconsidered. Merriman and he had assumed that Yandell would be watched by the most competent spies in the world. It would be useless to call the chief out of bed at this awkward hour to confide a suspicion which he could not hold up with proof. Doubtless it was best to let Yandell go and, if he were not so ingenuous as he seemed, give himself away to professionals who would know how to deal with him. Dakan turned off the electric heat and left the hutch, to go soberly to bed.

That afternoon at one o'clock he met Merriman in the chess room.

"You look as if you had had a good sleep," Merriman commented.

"I did. Anything new?"

"Nothing much. Yandell seems to be a good hearted fellow," he remarked dryly. "My first code report from the detectives states that he called on Hardinge at the hospital this morning."

"How did he know where Hardinge was?" Dakan demanded.

"Did you ever find anything that Yandell couldn't nose into? He asked the pilot of the racer."

"How simple. Just like Pobby. I hope he didn't see Hardinge?"

"Miss Douglas attended to that. According to the agents, she told him that Hardinge was suffering from a severe digestive disturbance, and could see no one but the nurse and the doctor. You arranged that, I suppose?"

Dakan nodded. "Is Hardinge any better?"

"Everything seems to be going smoothly. He is still not quite rational at times. Well, shall be start? I ordered the pilot to be ready at one."

"That lazy beggar will become a chronic worker, if you're not careful," Dakan laughed. "How's the wind down in the valley today?"

"They reported the usual thing half an hour ago—blowing great guns and hot as a furnace. We shall have to sit inside, I'm afraid, which won't be any too pleasant in the heat."

"It won't last more than five minutes," Dakan comforted.

They boarded the racer, and carefully closed every door and window. Merriman gave the signal to start, and the helio rose instantly to a height of about a thousand feet, and then shot directly east, out over the desert valley.

Glancing down as the helio dropped vertically to the desert floor, they saw a whirling inferno of salt and borax crystals rush up to meet them. A major storm was raging over the whole valley. The thermometer in the cabin shot up to 126, and the two passengers gasped and panted in the suffocating closeness. As the helio tumbled into the glittering maelstrom of salt and dust, the pilot hastily switched on all four gyro stabilizers and brought the plane to instant rest. Then, while the screaming clouds hurled their stinging masses of salt crystals and pebbles at their man-made conqueror in a futile effort to destroy it, the helio dropped slowly down in a perfectly vertical descent. When within fifty feet of the ground, the pilot proceeded cautiously toward the western wall of the valley, navigating solely by his instruments. To see even a yard ahead in that seething inferno was impossible.

"Look at that," Merriman panted, pointing to the thermometer. It registered 136. "Can't the pilot speed up?"

"Not very well, without risk of a smash against the door. We shall be there in half a minute."

Fortunately they were expected, otherwise they might have been forced to roast another five minutes in their airtight cabin. Merriman had rayed the

superintendent of the biological laboratories before ordering out the racer. As the plane neared the western wall, a gauge on the pilot's instrument board told off the distance—200 feet, 100, finally 10. Still they could see nothing ahead of them in the raging salt storm. The pilot halted for a second, pressed his announcer, and waited till the response light on his board flashed up twice, first green, then white. At the signal to go ahead, he shot forward. A clang of steel on steel echoed behind them, a last futile flurry of whirling salt enveloped the plane and suddenly spent all of its force in a fruitless assault upon the farther steel doors, a hundred feet down the tunnel, and a brilliant white light flooded the cabin. Merriman hastily lowered the windows on his side, and Dakan slid back the doors. Instantly they were enveloped in a refreshing coolness. Save for the baffled scouring of salt and sand on the far side of the solid steel gates which they had just passed, they found themselves in dead silence. The pilot brought the plane to ground, and the two passengers stepped out.

"Signal them that we are here," Merriman ordered. "You may as well stay with the plane until we return, unless you would care to come with us?"

"No thank you, sir. I shall take a nap," the pilot replied somewhat pointedly.

"Do," Merriman responded. "I shall probably want you to spin me into Los Angeles after dinner."

IN answer to the pilot's signal, the farther steel doors slid back noiselessly, revealing a well-lighted, quartz tiled corridor. Entering it, they passed into the reception office, and found the superintendent waiting to receive them.

"Those storm traps are a great convenience," Merriman commented, turning to the tall steel doors which were just closing behind them.

"They are," the superintendent agreed. "I shouldn't care to try to get in or out of here on a day like this without using a storm chamber. What would you like to see first, Mr. Merriman? The men are expecting you, so you have a fairly wide choice."

"What's new and interesting?"

"A great deal. Castellani was just preparing a report for you when we got your message. Perhaps you would like to see one of the specimens?"

"Ah! He has finally got some results with those beetles of his?"

"He hopes so."

"What do the others think about it?" Dakan asked.

"Well," the superintendent admitted, "they are not convinced."

"Experts never are convinced," Merriman commented, "by the work of other experts. At least that has been my experience in dealing with you scientists, especially the biologists. The astronomers and physicists are not so skeptical. Let me have a look at this stuff of Castellani's. Probably I shan't understand what it means, but I'm a patient listener."

"Not always," Dakan reminded him, thinking of Pobby's reports.

As they passed along the brilliantly lighted corridors, pausing now and then for a brief look into some silent laboratory jammed with glistening automatic apparatus that functioned day and night without human guidance, the superintendent entertained them with a few items from the past year's work.

"We had a curious thing here yesterday morning, about an hour after sunrise," he announced as one of the items that might interest Merriman. "So far none of the men have been able to account for it. The geneticists working in Laboratory G of this gallery went on for half an hour or so before breakfast, to prepare for a sixteen hour uninterrupted run. They are working with Blatta Orientalis — oriental cockroaches."

"Unlovely little creatures," Dakan remarked. "I ran into them on my last vacation in China. Excuse me; please go on."

"They may not be much to look at," the superintendent agreed, "but they make beautiful material for studying the softer ray intensities. The men in Laboratory G, I was going to tell you, found everything in perfect condition during that half hour before breakfast. They did not spend long over their meal, as they were anxious to start the run. Not over twenty minutes could have elapsed between the time they left and the time they returned. When they got back to the laboratory they discovered all the cockroaches dead—a full ten thousand."

"What do you make of it?" Merriman asked.

"Nothing, as yet. Castellani has been working on the problem ever since."

"And is that what he wants me to see?"

"No—as he hasn't finished that yet, and it may not be of any particular interest or importance when he does. We suspect some fault in the generators, and are having them overhauled while he tries to find out what really killed all those priceless cockroaches. They were one of the most highly selected and best bred groups in all our stock. Their pedigree had been kept for nearly thirty-five years. And now they are wiped out—a total loss. I'm sorry to have to report such a disaster, Mr. Merriman. The money loss alone, if we count all the time that has been spent on that breed for the past thirty-five years, will run into the hundreds of thousand of dollars. If it is due to any carelessness on our parts, I think we should resign."

"Don't be in too great a hurry," Merriman counselled. "It has just dawned on me that I may have murdered all those cockroaches."

"You?" the superintendent demanded in astonishment. "I don't see the joke. Those insects were worth a considerable fortune."

"So I can imagine. Really, I'm awfully sorry. The money loss is a minor detail. It is all the lost work of your men that's the serious factor. Dakan," he continued, "could the new focalizer have had anything to do with this? If so, it is all my fault. I asked you to act as showman."

Dakan considered the possibility thoughtfully.

"I believe it may," he admitted reluctantly. "I should have been more careful in tipping that lens." He took a pencil from his pocket and began searching for a piece of paper.

"Will this do?" the superintendent asked, offering an old envelope.

DAKAN absently took the envelope and jotted down a few figures. He remembered the exact time and triple setting of the mirror of the new focalizer when he had demonstrated it for Merriman.

"What is the exact location of Laboratory G?"

The superintendent gave the necessary coordinates. Dakan inserted them into his equations and calculated in silence.

"It comes out right," he announced after a few minutes. "Or rather wrong. There is a high possibility that the rays from the new focalizer were concentrated on Laboratory G at the time those cockroaches were killed."

"But I don't understand," the superintendent objected. "All the rich regions of the sky were below the horizon when this happened."

"That's the strange thing about it," Dakan agreed. "It would be impossible to direct any appreciable pencil of nebular rays on this laboratory at that time of day with the focalizer where it is."

"You pointed the lens directly at the sun," Merriman reminded him.

"Which only makes it the more incomprehensible. Who ever heard of a lethal dosage being concentrated out of ordinary sunlight?"

"Nobody," the superintendent agreed, "unless you did it accidentally yesterday morning."

"If I did," Dakan hesitated, "I have made a brand new discovery—unintentionally of course, like a good many of the major ones." He paused abruptly, a glow of understanding dawning in his eyes. "I believe I have stumbled onto something pretty good," he exclaimed. "The analysis of the sun's activity yesterday will settle the question. Can I ray the Observatory from here?"

"There's a radiophone in that room ahead to the left."

Dakan dashed for the instrument and instructed the proper department at the Observatory to have a detailed analysis of the sun's radiation for the past thirty-six hours ready for him by five o'clock that afternoon. As such analyses are but seldom made nowadays, the crude routine reports sufficing for weather and temperature predictions, the department was not a little astonished. Nevertheless they promised to have the work done by five o'clock.

"There may be more on those plates," Dakan remarked in a low tone to Merriman, who had followed him before the superintendent rejoined them, "than we have suspected."

"Good Lord," Merriman groaned, "what if we really did kill those cockroaches?"

"Unless they died of natural causes." Dakan asserted, "which is against all probability, "we have something new to worry about. I never dreamed—"

The superintendent coming up at the instant, Dakan broke off short, and Merriman hastily proposed a visit to Castellani's laboratory. To reach it, they had to descend about seven hundred feet, in a well lighted elevator, to another system of white tiled galleries and research rooms. These had been constructed nearly seventy-five years before, when an accidental discovery revealed the ideal conditions for biological research in the chambers and galleries of the long disused mine. This, of course, was years before the first focalizer was constructed on the surrounding mountains. But, with the phenomenal advances in astronomy of the earlier decades of the modern age, it soon became apparent that the workers on the great problem could not have found a better location for their delicate experiments had they searched the whole earth.

Half in jest, successive governing boards claimed that they had foreseen roughly the general development of biology, and had seized on the ancient mines in the roots of the mountains as the logical place for the great experiment.

Castellani's laboratory, unlike most of the others, was almost bare of apparatus. The perfectly tempered artificial daylight revealed only a battery of microscopes and their accessory motion picture projectors, the customary train of lenses for ray concentration, and a range of blue enamel cabinets with quartz doors, where the biologist filed his slides and films.

When the visitors entered, they found Castellani perched above an individual motion-microscope, following with absorbed attention the fast-motion unfolding of a microscopic drama which it had taken him three years to prepare and record in permanent form. Each tiny photograph of all the thousands that now flashed by under his eye in a connected, evolving sequence, had taken hours to prepare. Viewed by the laborious process of projection one at a time on a screen, those slides might possibly have revealed their deeper significance to a mind capable of retaining tens of thousands of disconnected details; seen through the medium of rapid motion, they lived and acted out their whole stupendous drama in less than five minutes, so that even the dullest could follow the play and be convinced.

Hearing them enter, Castellani switched off the motor, and turned to greet them. He was a diminutive man physically, rather like a black wasp, constantly moving with quick flashing turns of his eyes and hands—of every part of his body, it seemed—when he was not perched like a lean, restive mosquito above one of his microscopes. The keen little man was so bristling with unexpended energy that those who shook hands with him were sometimes quite disappointed at not getting an electric shock.

"I hear you think you have something pretty good, Castellani," Merriman began after the usual exchange of civilities.

"Think, Mr. Merriman? Think? I know! See for yourself. Ah, you will look. You are not like those so obstinate scholastics who would not put the eye to the telescope of my sublime countryman, the incomparable Galileo. See, I start the motor, the film begins all over again, you put your eye there, and you look. That is all."

MERRIMAN stared in fascination at the marvelous motion picture under the microscope. It was no mere drama in the flat that he witnessed, but a mazy dance of changing solid shapes that swayed toward their appointed places in the intricate, swiftly changing figures of the dance. It was indeed a dance that he saw, and a more perfect dance than ever had been imagined by a human being, for it was the dance of life. A brief four and a half minutes, and the dance was ended. Merriman straightened up with a sigh. Castellani stopped the motor.

"You saw?" he demanded.

"That is a masterpiece," Merriman declared. "Even a layman like me could see that this is the best film ever made of the process of cell division. How on earth did you do it?"

Castellani shrugged his shoulders. "Nature, not I."

"You mean," Dakan interjected, "you actually photographed the living cells in one of your specimens?"

"What else? How could I otherwise fix all those so subtle motions that we destroy when we deprive our material of life—the very thing we wish to understand? I have caught life in the making. Now," he snapped, "a layman has looked. The layman—pardon me, Mr. Merriman—saw only the pretty chromosomes and the globules dancing about in the cell. At first there were so many. A little later there were more. You shall look, Mr. Dakan. You are not a layman. I will show you more than the moons of Jupiter, or the rings of Saturn, or even the sudden new stars in your nebulae." He motioned Dakan to the microscope. "The trained eye will *see*, it will not merely *look*. The trained eye will see a thing that nature never made, but that I created!"

With what looked suspiciously like a wink at Merriman and the superintendent, Dakan put his eye to the microscope. Disciplined by arduous years of exact, impersonal observing, Dakan instantly became little more than a concentrated sense of sight and a coldly alert mind.

The living spindles progressed through their intricate evolutions once more, and where one living cell had been, two divided off, each exactly like the parent, complete with its full complement of chromosomes. But were the daughter cells exactly like their parent? Dakan scarcely breathed. Surely that pair of minute reddish needle-pricks of light in each of the daughter cells, one at the south pole and the other at the north—exactly alike in both cells—had not been present in the parent cell?

Not taking his eye from the lens, he reached out and reset the motor. Again the dance of life unfolded from its stately beginning to its balanced end. This time he caught the minute specks of light at the very moment of their birth. He switched off the motor.

"You've done it," he said.

"And you are the first man," Castellani replied gravely, "who has had eyes to see it. Dozens of my very learned colleagues have looked, but they have not seen. Others have seen. But they all try to explain away what they see—just like those very learned clerics who did see the moons of Jupiter. They proved that the moons were not there, but defects in Galileo's optic tube. It made me feel not unworthy of the immortal Galileo's cast-off shoes," he concluded with a ludicrous grimace.

"You might tell me what I missed," Merriman complained.

"Take another look," Dakan advised. "Then there will be two of us to back up Castellani. Don't concentrate on the big things; look where there seems to be nothing."

After the third attempt, Merriman discovered the specks.

"You have given me the thrill I've waited for all my life," he said to Castellani. "I know now what Keats meant when he said

'Silent, upon a peak in Darien.' "

"This is greater than any new planet or new star," Dakan added. Those things are commonplace. Any amateur can pick up a dozen new stars in one of the nearer nebulae with the five hundred foot on any night of the year. But who ever did anything like this before?"

"Nobody," the skeptical superintendent admitted. "If you gentlemen will excuse me, I shall wait till Mr. Castellani convinces at least a dozen of his fellow experts."

"You may wait a long time," Merriman remarked. "Why not see for yourself?"

"I have. This is too revolutionary a step to be admitted offhand. We must go slow before announcing a thing of this magnitude, that after all may turn out to be a mistake. You understand, don't you, Castellani?"

CASTELLANI bowed formally. "I do. So did Galileo. However, I do not blame you. I can wait. The female beetle from whom I made these pictures is alive and healthy. She is five years old, in her prime. She lays but once in her life. I expect her to deposit her eggs three months from now. If the eggs hatch, we shall see whether I have created a new living thing—a new species, I claim, and not a mere mutation of a known insect that any beginner can breed by the hundred. We know all the possible variations of this beetle by the ordinary laws of heredity. There are exactly 1024 varieties of her possible in the ordinary course of nature—wing mutations, eye mutations, and the like. All of these, I repeat, I emphasize, gentlemen, are tabulated and have been exhaustively studied by geneticists for the past sev-

enty years.

"Never in the course of natural evolution can this family of beetles produce any but one of the 1024 known mutations of their kind. We shall see whether the offspring of my female, whose cells I have re-created, belong to the 1024. If not, I win; I shall have created a species of living things beyond the power of unaided nature to create. I can wait three months, gentlemen."

The superintendent received this speech with a dry smile.

"Not to change the subject too abruptly," he said, "have you found out what killed all those oriental cockroaches in Laboratory G?"

"Oh, that. Yes. I had almost forgotten. I finished them nearly an hour and a half ago. See." He darted to a cabinet and brought out a dozen slides. "Any one can see *this* for himself," he continued with a touch of sarcasm, carefully placing three of the slides in position on as many of the microscopes.

"Look, gentlemen. Those are slides prepared from the nerve tissue taken from the ganglia of certain of those unfortunate cockroaches. I have many more slides if these do not convince you. My assistants, not I, prepared them. It is a work for cooks and tailors."

They saw at a glance what well might have caused the death of any animal. Dakan drew back, feeling suddenly sick and faint.

"Is that nerve tissue?"

"It was," Castellani confirmed. "I should not care to guess what it is now. It might make me sick at my stomach, as you say in America."

"But it looks like a forest of toadstools," Merriman objected.

"Undoubtedly," Castellani agreed. "My assistants—twenty-two of them, gentlemen, think with me that what you have just seen is an explosive growth of microscopic fungi. My assistants are at present trying to identify the particular fungus—it is the same in all. Then," he continued ironically, "they will be able to name the disease. I do not think they will identify those interesting little toadstools. For they are as new to human knowledge as those specks of light in my beetle's cells."

"But," the superintendent objected, "it is impossible that any disease could have infected and wiped out ten thousand healthy specimens practically simultaneously."

"It did," Castellani retorted. "The cockroaches prove it."

This being unanswerable, there was an awkward silence.

"If you don't mind," Dakan said, "I think I'll go back at once to the Observatory. I can send the racer back for you, Mr. Merriman, if you wish to stay."

"Thanks; I'll come too."

As they closed the windows of the plane preparatory to their dash into the heat and storm, Merriman expressed the doubt which had been troubling him.

"Is there any possibility of that horrible fungus disease attacking human beings, do you suppose? Under the right conditions, I mean?"

"I don't know. That's what *I* shall try to make a guess at from the reports of the sun's activity yesterday. There's still a lot of hydrogen and helium in the sun."

"I wish I hadn't played the fool with that focalizer," Merriman groaned.

"It may turn out to be the luckiest thing you ever did."

"How?"

"It puts another clue in our hands."

"Yes, if it isn't too late."

CHAPTER X

A Desperate Clue

ON returning to the Observatory, Dakan and Merriman found Kate anxiously waiting for them.

"How is Hardinge?" they asked together.

"Worse, I'm afraid," she confessed in a voice which was not quite steady. She turned to Dakan. "He keeps asking for a paper he left in his desk, and a slide rule. I took a special here. Is there any objection to my finding what he wants and taking it back to him?"

Merriman and Dakan exchanged glances. Kate sensed their momentary doubt, and hurried on.

"There will be no danger of the paper getting into the wrong hands. In fact," she confessed, "I memorized exactly what was on it when I wrote it yesterday evening at Mr. Hardinge's request. I

came back really to destroy the paper on my own responsibility. A slide rule can be picked up anywhere—I shan't even take his own to him, for fear of exciting suspicion."

"It was really unnecessary then," Dakan asked, " to make the trip at all?"

"Totally. I did it merely to pacify him. And, of course, to destroy the paper."

"You can write out what he wants at a moment's notice?" Merriman suggested.

"That is what I intend to do the minute I get back—provided he hasn't forgotten asking me to go."

"He's still not quite right in the head?"

"As I said, I think he is getting worse."

Again Merriman glanced sharply at Dakan.

"Don't you think it about time, Miss Douglas," Dakan suggested, "to tell us a little of what is between you and Hardinge?"

She did not hesitate. "If it were my own affair alone, I should have told you everything long ago. But Mr. Hardinge has set out to investigate this theft in his own way, and I feel sure he would resent it if his work—which really is barely started—were to be discussed before he knows how reasonable it may be." She had made quite a speech, almost à la Pobby, as if she had rehearsed it many times.

"Never mind that," Dakan said quietly. "Mr. Merriman and I have just seen something that makes all consideration of private feelings impossible. Hardinge may be ill for weeks. The danger we anticipate may mature in less than a week—tomorrow, for all we know. Hadn't you better be quite frank? I'll take the responsibility of explaining to Hardinge."

"I second that," Merriman cut in. "How about it, Miss Douglas?"

Her short struggle between loyalty to Hardinge and her own dread, based on expert knowledge, of what might even then be hanging over the human race, was decided as intelligently as one with her training and heredity must have decided it. Hardinge, she felt, would advise her to do exactly as she now did, were he present.

"Hadn't you better come and see for yourselves what Mr. Hardinge asked me to take him? I couldn't enter his cabin without authorization from one of you. That is why I did not find the paper and return to Los Angeles at once."

They followed her to Hardinge's cabin. Kate went at once to the drawer where she had secreted the slide rule and sheet of paper at Hardinge's request while Dakan was searching for the brandy. Opening the drawer, she saw the slide rule, but no sheet of paper.

"It's gone," she announced, facing them.

"Look in all the drawers," Dakan advised coolly.

"It is useless," she replied, nevertheless searching thoroughly.

Merriman stood by watching the proceeding in silence. At last all were convinced that no scrap of paper had slipped down the back of any drawer.

"You said you could reproduce what was on that paper?" Merriman suggested.

"'Ten millimetres; four metres; star'."

"What do you make of it?" Merriman persisted meaningly.

"Nothing whatever."

"And was the writing of that simple message all that Mr. Hardinge asked you to do yesterday?"

"At the time, yes."

"What about earlier in the afternoon?"

"I don't know to what you are referring."

"The visit Hardinge paid you when he returned from Los Angeles."

Kate flushed. "I don't know I was being spied on," she replied with an angry glance at Dakan.

"Yandell reported," Dakan informed her shortly.

"He would," she said. Suddenly her manner changed. "Has either of you thought of keeping an eye on him?" she flashed.

"I have," Merriman replied. "Now, Miss Douglas, hadn't you better tell us everything, and not just a few meaningless scraps? If you think that you are helping Hardinge by holding back, I assure you that you are mistaken."

"What do you mean? Surely you don't suspect him?"

"Of course I do not. You know that as well as I do. And, if you wish me to

say it, I suspect you of nothing worse than a foolish, old-fashioned loyalty to what you consider your pledged word. Now look here, Miss Douglas. Keeping one's word in the face of unforeseen danger, merely because it used to be considered the sporting thing to do, went out of fashion seventy years before you were born. Get up to date! Tell us what else you did for Hardinge."

"If I refuse, what will you do?"

"That's a fair question," Merriman admitted. "If you refuse, Miss Douglas, I shall be just as old fashioned as you are. I shall have you locked up and guarded in your cabin until Hardinge is well again. Then I shall ask him, among other things, whether he doesn't think you are a very foolish young woman. I'm sure he will agree."

KATE considered. She knew Merriman would be as good as his threat. That would mean not seeing Hardinge for possibly several weeks. To tell everything, even at the expense of breaking her word, was the wiser course. The modern point of view, she decided, after all is the sane one, if it is occasionally rather unpleasant. She told in detail about developing the film, and of its disappearance from Hardinge's sitting room. To their sharp questions as to what was on the film, she asserted her complete ignorance. So far as she could see, it was just a blur. Without a strong pocket lens or an enlarging screen she could have made nothing of it.

"And that," she concluded, "is all I know. On my word of honor," she added with a laugh.

"That kind of a word still means something," Merriman admitted, "especially when you say it in that tone. Now, don't you feel better?"

"No," she declared defiantly. "I have disobeyed Mr. Hardinge, and none of us is any the wiser."

"That's true," Dakan agreed ruefully. "Lord! I wish that man would get well. He evidently has some sort of an idea. The rest of us know nothing."

"Except what Pobby told you," Kate comforted maliciously.

"I'm taking care of him," Merriman asserted with conviction. "Don't worry. Did your special go back to Los Angeles?" Kate nodded. "Very well, you can come with me in the racer. I think we might as well start at once."

"Will you be back tonight?" Dakan called after them.

"Miss Douglas won't," Merriman replied. "I may. It depends upon how the invalid is. You'll be working as usual?"

"Yes, till about four thirty."

Dakan hurried off to get the analyses of the sun's activity for the preceding day. The assistant—a young woman—in charge of the work handed over the elaborate charts with an inquiring glance which was almost painful in its appealing curiosity. Dakan however seized the charts and left her with a curt word of thanks, still wondering.

"Now what on earth can he want with all that antiquated stuff?" she mused. "Is our Director losing his mind?"

Arrived at his study, Dakan prepared to spend the rest of the afternoon before dinner time in an exhaustive study of the sun's activity charts. In three minutes he was deep in his calculations.

What he and Merriman had seen that afternoon was the last scene in one great drama and, they hoped, the first in a greater. Long before the Observatory was even dreamed of, or the scientific age arrived almost at one stride, the pre-scientific miners had honeycombed the mountains with their wasteful tunnels and galleries, in search of the precious, rare minerals which made the desert ranges the wonder of the mining world.

An accidental discovery in the third decade of the twentieth century, made by an observant mining engineer, changed the whole course, not of mining, but of biology. A bronze tablet, two thousand feet underground in the transformed mineral pocket where he made his first epochal observation, commemorates to this day his fortunate ability to use his eyes and his ears.

Scores of common miners and highly trained engineers had looked at the same thing and had listened to the same sound, but the memorable Erickson was the first to see or hear anything.

It was as Castellani had hinted to Merriman: the born and trained scientist sees and hears; the layman merely looks and listens.

Erickson cultivated widely diversified hobbies outside of his profession as an expert on the rare earths. In particular he read regularly the fairly accurate

weekly reports of scientific progress broadcasted in his day by a Washington news agency. The report of Muller's great experiment with vinegar flies fired his imagination. By dosing the flies with X-rays, Muller, for the first time in history, had created permanent, heritable differences—transmitted with inerrant accuracy through scores of generations.

It might only be a difference in eye color, or a change in the shape of the wings that was thus induced independently of natural evolution. But, no matter how insignificant outwardly, the minute mutations were of the profoundest significance in a deeper sense. Man had at last succeeded in modifying the very structure of the cells of living creatures, and controlling artificially the course of heredity. It was years before the layman at large even heard of this tremendous advance, and when he did—unless he were of an unusually inquisitive twist of mind—he asked What of it, and hunted through his paper for the sport page or the comic supplement.

Erickson was only a layman, but he was an inquisitive specimen. So, while prowling about the deep underground galleries of the mines under his supervision, he kept his eyes and his ears open. If X-rays can permanently modify living things and their innumerable generations of descendants, he asked, why shouldn't the highly penetrating radiations given off by certain rare minerals have a similar effect?

THE miners were pestered by a particularly vicious and aggressive fly, as big as a bluebottle, which somehow picked up a living in the salt and borax desert. How it had lived before human beings began trickling into the desert, remained a mystery till Erickson solved the problem completely. These voracious pests were a bright, iridescent green, with tenacious feet and strong, hairy legs. An entomologist would have guessed their kinship with the common greenbottle that swarms about stables, horses and mules; Erickson justified the guess.

The greenbottles had accompanied the first prospectors and their burros, feasting on the camp refuse. As more expert miners, with elaborate camp kitchens followed the prospectors, the flies multiplied like a mathematical nightmare. The hardier of the multitude quickly adapted themselves to the desert, and followed the miners down the cooler tunnels, a yard at a time, as the men burrowed their way into the roots of the scorched ranges in search of precious minerals. The miners themselves soon took to living in their underground chambers and galleries, in preference to battling day and night against the furnace blasts of whirling salt and dust that made the desert a hell. The flies thus had plenty of food, as they too took up their abode in the electrically lighted galleries and chambers.

Erickson's experiment was extremely simple. He imported a large colony of common greenbottles from a distant city, housed them in roomy wire cages in a disused gallery from which a vast quantity of radioactive minerals had been mined, fed his pets generously, and waited results. Although he was no expert at this sort of thing, he did quite creditably. As soon as one batch of flies had deposited their eggs, he destroyed the parents, and concentrated his attention on the coming generation. This in turn, when it had propagated, was destroyed, and so on through five hundred generations.

The final generation paid him for all his trouble. In his underground rambles, Erickson had noticed that the energetic flies infesting the mines emitted a far shriller buzz than did common bluebottles of the same size; also, the eyes of the mine flies bulged inordinately, like those of a human being suffering from a thyroid disorder. The shriller buzz was easily accounted for; the pests were at least twice as energetic as any ordinary bluebottle, and their wings vibrated much faster as they darted from one victim to the next. The pop-eyed effect was more deeply seated. The important thing was that parent passed it on to offspring for generation after generation. Erickson noted with satisfaction that his last generation of flies was exactly like those in the mines.

It was a new species bred from one as ancient as the plagues of Egypt. The descendants of the five hundredth generation continued to breed true, and the point was half proved. The radioactive emanations from those extraordinarily

rich rocks had effectively changed the natural course of evolution for those green flies. The discovery was announced; biologists flocked to the mines, checked the experiments, and then returned to their laboratories to do the work all over again under control conditions with tiny tubes of radioactive minerals taken from the mines.

From that obscure beginning the present observatory, and the collaborating biological laboratories in the roots of the desert mountains, had developed almost inevitably. For nearly thirty years the biologists struggled ineffectively to reproduce the mutations of living things, observed without the slightest difficulty in the mines, under test conditions in their own city laboratories all over the world.

Their failure demonstrated that some deeper cause was at work. In the mines they succeeded always; in their laboratories they failed invariably. They began to suspect that the peculiar combination of rare minerals, in precisely the proportions accumulated by natural processes through geologic ages, as they existed in the desert ranges, was essential to the success of the experiments. This has since been abundantly proved to be the fact.

Mere samples of this mineral or that, taken at random from the mines, do not produce the effect. To cause mutations in living creatures, the whole complex mass of the desert ranges, and of the incredibly rich deposits under the desert floor itself, must be applied. Realizing this at last, the biologists transferred their apparatus to the mines, and lived there themselves for periods of from five to thirty years. Thus the present laboratories were started.

Tampering with nature is a risky business, as those devoted biologists soon learned. They suspected that the emanations that modified the heredity of the various insects with which they worked, would also have some effect upon human beings. Would their children exhibit curious freakiness of eye, limb, or mind, which would be transmitted inevitably to all their descendants? They hoped not, but were far from sure. It did not follow, of course, that the effect upon human beings, with their radically different cells, would be in any way comparable with that upon insects, whose cell-structure puts them in another class What would the human children be like?

THE answer was disconcertingly simple. There were no children. All of the workers had been sterilized for life by their constant exposure to the emanations in the mines. A historical search was made, as complete as possible so many years after the event, to discover whether the old miners had been similarly affected. So far as the search went, it bore out the biologists' suspicion. Those deep mines had always been as effective a sterilizer for human beings as repeated applications of X-rays.

It was then that the men and women in the underground laboratories learned to shield themselves from the harmful rays by glazing all the exposed surfaces of the rock with proper ray filters, and collecting what rays they needed from screened windows in the glaze.

When the modern age swung into its full stride with the art of breeding metals finally attained, the biological workers at last understood the reason for their success in the mine laboratories and their failure elsewhere. In the extraordinarily rich deposits of rare minerals in the ranges and the desert, the same "breeding" of one element from another was going on, but at a very much slower rate, as was taking place in the interior of the sun and in the billions of hot stars throughout the universe. It was the radiations from these almost infinitely slow, natural changes, as the activity of the ore deposits gradually died out, that was responsible for the new species of flies in the mines.

The desert range was the natural location for the greatest observatory on earth. Fortunately the same was true of the biological laboratories. The chief part of the astronomical program of the Observatory coincided with what the biologists would have suggested on their own account—an exhaustive study of the hard, penetrating radiations that streamed through space from all quarters of the sky, day and night. These rays, they suspected, were the ultimate source of life on our planet and of its rhythmic evolution through billions of years.

Impinging incessantly on the very atoms of dead matter, the cumulative effect of the rays had grouped and regrouped thousands or millions of the

dead particles until, here and there, one group persisted and stored up the energy poured into it from every quarter of the universe; it lived.

These hardest of all radiations as yet known to us are the scientific descendants of those still mentioned in our elementary school histories. They also trace their origin to that historic third decade of the twentieth century. When first discovered by the early astronomers of the scientific age they were mistaken for a harder variety of the Millikan (or cosmic) rays of the early twentieth century. In a sense they are such, of course, for they are merely a natural extension of the classic Millikan scale, far below the shortest wave lengths known to the historic workers. Their origin, it was soon discovered, was in the secondary discharges accompanying the evolutions of helium from hydrogen in the stars and nebulae and also, more rarely and in practically negligible amounts, in our own sun.

The secondary rays liberated by the hydrogen-helium transformation are in all probability, both the astronomers and the biologists now believe, the source not only of the modern art of metals, but also of life and its constant mutations up or down the scale of organic evolution. To collect and concentrate these rays from the richest regions of the sky was the problem now before the astronomers; to apply the full blast of them to reveal the deeply hidden mysteries of life and evolution was the expectation of the biologists. At last, after a search of many years, the richest region of the sky had been all but located.

At a quarter past six Dakan put away his sun charts. He was satisfied and profoundly disturbed. The charts had amply confirmed what he expected and feared to discover. There *had* been an almost unprecedented outburst of solar activity in progress when he, to entertain Merriman, had tipped the lens of the focalizer directly at the early morning sun. The outburst, his calculations showed, had been in progress for nearly three weeks, and was now approaching its maximum. Such outbursts have long been known to be periodic, like the sunspots.

Why had he not ascertained whether one was in progress before tipping the lens at the sun? With such a solar storm raging it was at least foolhardy to concentrate the rays where, in all probability, they must focus on one of the laboratories honeycombing the roots of the desert range. Thinking it over, he decided that the mishap might after all be a stroke of undeserved good fortune. He rose to go to the visitors' dormitories to see whether Merriman had yet returned from Los Angeles.

Merriman had just arrived. Seeing Dakan's excitement, he held his own disturbing news.

"What's up?" he asked.

Dakan explained his findings. "This almost proves," he concluded, "that the hydrogen-helium secondary rays, when sufficiently concentrated, can produce almost instant death."

"Worse," Merriman added grimly. "The nerve tissues of the cockroaches looked like a mass of spores—fungi of some devilish kind. I need not speculate. You see the obvious possibilities."

"Too obvious, some of them. There is one bright spot, however. Our hydrogen-helium plates now stand a reasonable chance of being found before it is too late. I doubt now whether the first clue will come through an improvement in the art of metals. Rather, I suspect we shall find biological evidence leading to the thieves. When we do, we must act instantly. If necessary we shall have to violate international law and recover the plates by force. Hadn't you better warn the world police and biological stations everywhere to keep a sharp lookout for anything unusual?"

"I shall do so at once. Wait dinner for me, will you? I may be a few minutes late."

DAKAN cleaned up and strolled over to the lounge of the dining pavilion. The company seemed strangely depressed. Dakan's order, suspending all leaves from the Mountain for an indefinite period, had at last been seen by all of the five hundred or more workers at the Observatory.

"Why this sudden decision that we must all work like slaves?" a young girl demanded. "But for your order I should soon have been enjoying myself in Vienna."

Dakan smiled. "Didn't you read the notice?"

"It said one of the cooks' helpers is

ill. Why don't you send him to the hospital?"

"Perhaps we have. But that doesn't do the rest of us any good. We're quarantined."

She gave him a pouting glance and turned away to console herself with telephotoscopic pictures of what was then happening in her beloved Vienna.

The Mexicans and South Americans next attacked him in a body. According to their spokesman, the centennial celebrations of the South American Union were to begin four days hence, and they had important parts to play in the ceremonies.

Dakan patiently explained all over again. They could see it all on the telephotoscopes anyway, he comforted. Perhaps; but it wouldn't be the same as being on the spot—to which Dakan agreed. Finally seeing that he could not be moved, they marched off huffily.

Before another delegation could descend on him, the dinner signal saved him. He watched them troop into the dining hall, apparently all in good spirits again, and sat down to wait for Merriman. The older man was half an hour late.

"They were busy at the London office, and I had to wait," he explained. "I saw Hardinge," he went on. "The poor fellow is in pretty bad shape."

"He will recover?" Dakan asked anxiously.

"The physicians seem fairly confident, although they say it may be months before he can do any serious work. I thought it best to leave Kate in Los Angeles indefinitely. She can sit with him as many hours of the day as she can stand it. She is to let us know at once when Hardinge is clearheaded enough to get off his mind whatever is troubling him. He tried desperately to tell me something, but I could make nothing of it. Finally the nurse gave him a sedative and ordered me out."

"Well," Dakan replied hopefully, "we may trace the plates without him, if the thieves attempt to use them."

"I hope not," Merriman ejaculated. "I mean, if it goes that far, we shall probably be too late to undo the mischief. It's a pretty desperate sort of clue to rely on."

After dinner Dakan went to work as usual, and Merriman hurried off to the central office to stir up the police by radiophone to greater effort.

CHAPTER XI

Remembering

THE anxious weeks dragged by with no clue to the whereabouts of the missing plates. The International Police had long since confided to Merriman the disappointing truth of the unaccountable failure to capture the bandit plane. The battle in the air above the upper Amazon jungle had been discussed exhaustively from every possible angle without result.

At first the police hoped that the shattered remains of the patrol cruiser would betray an enemy. After two weeks' search the missing patrol cruiser was discovered, battered flat on the bedrock eighty feet down in the mud of a tributary of the Amazon. The carapace was so badly smashed that it was impossible to distinguish the marks of the enemy's heel which had wrecked the cruiser in midair. That possible clue was abandoned.

At the scene of the robbery, dust storms on the desert had obliterated all footprints before the Los Angeles Police, at Hardinge's suggestions, arrived to investigate.

There remained but three possibilities. If Hardinge recovered, he might be able to suggest an attack. Before his desperate illness, he had seemed to know what he was talking about when he declared to Merriman that he did have a clue. It had given him, he asserted, the greatest shock of his life. Next, there was Dakan's plan. Thus far, nothing had come of his policy of wait and see. No new technique in the art of metals startled the engineering world. Nor had any biological sensation aroused the suspicions of geneticists.

The third possibility was that which Merriman would gladly have believed a fact, had not a constant dull suspicion ached in his mind that, to accept this happy way out, was precisely what the enemy intended. The International Police assured him that no cruiser aloft on the night following the holdup could

possibly have eluded their air forces. The net, they declared, was inescapable. It followed then, on their confident theory, that the fleeing cruiser, finding itself hemmed in on all sides, had attempted to elude its pursuers by taking the desperate resort of an unmapped air channel.

As a regular part of the routine of a world alarm, close nets of patrol cruisers were spread at the one hundred, fifty, forty, thirty and twenty thousand foot levels, to force any suspect to fly low. The position indicators of the patrols at these levels would infallibly pick up all planes attempting to slip through between the layers. It followed, the police declared, that the enemy, forced to fly low, had crashed into a mountain range and had been destroyed.

To Merriman's objection that the thousands of air observers sent up by the International Police had been scanning the mountain ranges of the world for eight weeks without result, the chief replied that the search must necessarily be long and difficult. Every square foot of the ranges above the timber line had been scrutinized. The discovery of a wreck lower down might well demand years of searching. The patrols were still searching.

"Give us time, Mr. Merriman," the International Chief begged, "and I promise you we will discover the wreck."

"If it exists," Merriman qualified grimly.

"You have another theory?"

"Partly mine. I was at the Observatory again last week, and had a long talk with Dakan. He suggests that the thieves have run into unexpected difficulties in deciphering the scientific information on the plates."

"And you?"

"Not quite the same. Whenever I am at the Observatory, I find myself thinking as they think out there. When I get back to London, my mind begins to work independently. Yesterday morning I hit upon what I believe is the true explanation for the inactivity of our enemies. It is this. In attempting to use the plates, they have run into dangers they never dreamed of, and they are holding back until they find out how to proceed less dangerously. They are afraid of destroying everything — themselves first, and us a few seconds later. If they start the full hydrogen-helium transformation going without proper control, a thing our own men don't yet know how to do, they will wipe us out like a swarm of midges in an electric furnace."

The chief received this theory in uneasy silence. At length, taking his courage in his hands, he boldly asked what danger might be anticipated from an improper partial use of the plates.

"That's the devil of it," Merriman confessed. "Neither Dakan nor any of the men in the mines will risk a guess."

"But they agree that there is a real danger?"

"All. It is the first time in my experience that I have seen experts unanimous on anything."

"Why do they anticipate danger?" the skeptical chief demanded. "You must admit that I have a right to know."

"You have," Merriman admitted readily. He puffed reminiscently at his fat black cheroot. "That," he declared, "is precisely what makes it so hard for me to speak out."

"I fear I don't follow."

"Nor," Merriman laughed ruefully, "do I quite understand myself." He took a long pull at his cheroot and exhaled the blue smoke luxuriously. "Look here," he said. "You and I are practical men. Those boys and girls on the Mountain can't hold a candle to us in the ordinary human affairs. Mind," he admonished, "I am not presuming to put myself in the class of even the slowest of them. Some of those striplings of nineteen or twenty out there at the Observatory are so far ahead of me—of both of you and me, let me say—that I couldn't understand what they are doing if I lived to be a thousand. They are of a different calibre from men like us."

THE chief nodded, cordially. Not sure that he was getting Merriman's drift he nevertheless agreed on general principles. Some of those superior young demigods and snooty half-goddesses on the Mountain gave him a very severe pain in his self-esteem. They were under twenty-one, and world famous; he was fifty-seven, and who but a handful of incautious crooks had ever heard of him? It made him rather sore.

"You have it right," he said. "Those kids lack human experience."

"I didn't say that," Merriman demurred. "Yet it is half true. As a matter of fact, those green boys and girls out there can give us cards and spades even on sizing up human beings. No," he continued, cutting short the chief's interruption, "I am not contradicting myself. In ordinary human affairs you and I are their superiors. In everything else they beat us out of sight."

"But how—?"

"Simply thus," Merriman replied, anticipating the Chief's reasonable question. "They simply don't give a damn about ordinary human affairs. You and I do. Whether we are fools for doing so, I don't profess to know. Only I do know this: unless men like you and me look after the milk bottles and the burglars, those bright babies on the Mountain will first be robbed of their bottles, and then starved to death. So we should not feel inferior."

"I don't see," the chief objected, "what all this has to do with the point at issue."

"No? Then that just shows how different human beings can be. To me it is obvious. The professional code—pride, conceit, or fear of being shown up in the wrong—whatever you care to call it—is holding back those men on the Mountain, and in the desert laboratories, from speaking out what is on their minds. Weeks ago, when Dakan posted the order rescinding all leaves from the Mountain, there was, as you recall, a temporary uproar."

The chief nodded. "We thought we should catch our man then. But as practically all of them yelled at once to get off, we learned nothing."

"Nothing," Merriman agreed. "Except this. You probably did not notice it."

"No?" the chief asked, a trifle stiffly.

"No," Merriman asserted bluntly. "That is why you are what you are, and why I am what I am. Pardon me," he continued, after a long pull at his cheroot, "for playing the snob. But I happen to believe in snobbery. All men are not born equal. You noticed nothing peculiar in the behavior of those marooned astronomers?"

"Haven't my men been doing their damndest for the past three months to find out—"

"Exactly," Merriman cut him off. "Their damndest. And that is precisely what it amounts to. Has it not struck one of your criminal experts that the very readiness with which those workers accepted the order, is in itself suspicious?"

"You mean—?"

"It is obvious. Would a guilty man insist on his regular leave from duty?"

"He would be a fool if he did," the chief admitted.

"We agree on that. But what about the others?"

The chief considered. "I can't see," he confessed, "that anything follows."

"No?"

"Well, what does follow?"

"Nothing," Merriman asserted.

"This is no time to play the fool," the chief rather brusquely reminded him.

"You think not? See where reason has led you. Allow me to be explicit." He threw away his half smoked cheroot and lit another. "If you knew anything," he resumed, "about the morbid psychology of the professional genius in science, you would see that all those boys and girls on the Mountain are running true to type. They were not fooled by the lying order quarantining the Mountain. Did they object? They did. For exactly twenty-four hours. Then what happened?"

"They came to heel," the chief responded.

"They did. And why? Can you answer that?"

"I fear I can't."

"Because," Merriman declared impressively, "they sensed that something had gone radically askew."

"Your logic is beyond me," the chief confessed hopelessly.

"NO doubt. But hear the simple machinery of it. Those boys and girls have but one major passion in their lives—science. Sex, of course, plays its usual part, but it is not the dominant motif. To safeguard their instinctive urge, they will coat themselves over with a thick protection against all disturbing influences. The order forbidding leaves from the Mountain was a signal to protect themselves. Their scientific peace was in danger. Rather than let themselves be distracted by outside, human affairs from their sciences—which are in fact their art, their poetry, and their

love—they have lied, consciously and subconsciously, to deny that anything is amiss.

"They know that there has been a crucial disaster. What do they care? They don't give a damn. They believe that, no matter what happens, they will be taken care of, and be permitted, like queen bees, to continue propagating the children of their imaginations. I feel convinced," Merriman declared, "that this conscious self-protection of the very men and women whose lives are in the greatest danger, has clogged your investigation at every step."

"Their lives are in danger?" the chief queried in bewilderment.

"Not in the crude sense. If these plates are misused, the work of the Observatory will cease to be a factor in human progress."

"They know this?"

"Most of them. That is the point. To preserve its scientific ease intact for a certain three months means more to the mind of genius than the problematical assurance of security for a lifetime. Who can blame them? I can't. That—their tactics—is precisely how I made my thousands of millions in business. I dealt with stocks and bonds and international trade. These young men and women are trading their intellects on exactly the same sound principles that I used in finance. Those boys and girls know what is the matter. Will they help? No."

"I doubt—" the chief began, when the bulb of Merriman's radiophone glowed.

"Yes?" Merriman responded, switching on the connection. "I hear. Yes, the transmission is perfect. Who is calling me?"

"Dakan."

"Oh, how are you? That's fine. Anything new?"

For some three minutes Merriman listed to Dakan's report. Having cut off, he turned to the chief.

"They want me there tonight, if possible."

"What's up?"

"Hardinge is going back to the Mountain late this afternoon."

"I thought he was still invalided," the chief remarked.

"He is. But the doctors in Los Angeles say they have done everything they can for him. They are trusting to the associations of familiar surroundings to do the rest. I hope—"

"So do I," the chief agreed heartily. "Poor devil, he has had a terrible siege."

"If only he could remember what happened before he was knocked out," Merriman sighed, "we might settle this whole wretched business out of hand. His mind seems to be a perfect blank on everything that occurred between one and eight that afternoon. He doesn't even remember the dinner."

"He is all right otherwise?"

"Perfectly, according to the surgeons. His old skill at spectrum analysis seems to be quite unimpaired. Hardinge was, and is, a genius of the first rank in his own stuff."

"Miss Douglas is still with him?"

"Only in her usual capacity of assistant. Well, I must be starting, if I am to get there before they all go to bed. Want to come along?"

"Sorry, but I can't. There is a trifle here about an irregularity in the Zedten branch of the Public Health Service that will probably need my attention before morning. Those fellows out there have always been obstinate, nationalistic beggars."

"What sort of an irregularity?" Merriman demanded, his face tense.

"Oh, nothing much. Merely a neglect to report a blight attacking the rice crop. They never cooperate willingly."

"Is it serious?"

"I can't say yet. That is why I am staying here. The International Health office will have to decide."

Merriman paced the full length of the room before replying. His decision was carefully made. Facing the chief, he delivered it, deliberately.

"You must come with me to the Observatory," he said. "You can keep in touch with this office all the way. We must fly at the seventy thousand foot level to make the Observatory before dusk. That will mean installing a supertactile ray dial in the helio." He turned aside to give the necessary orders over the radiophone. "Shall we start?" he resumed, facing the bewildered chief.

"But I don't understand—"

"Never mind. The essential thing is that you confer at the earliest possible moment with Castellani."

"But Castellani is—"

"An expert on genetics. Also on plant pathology. He made his first great reputation on the Armenian plum rot—if you remember."

"Can't say that I do," the bewildered chief admitted as Merriman hustled him aboard the higher lane special.

"It doesn't greatly matter. The main thing is that this 'irregularity' regarding the rice disease may be a clue."

"But how on earth—"

"WAIT till you have seen Castellani's slides. Then you will admit anything. Got your respirator? All right; we're off." Merriman gave the signal, and the high-lane special shot to the seventy thousand foot lane. Then, like a bullet, it zipped due west.

Late that afternoon while Merriman and the Chief of the International Police were bravely fighting the inevitable nausea on their rocket flight in the upper lanes, Kate and Dakan were apprehensively inducting the shaky Hardinge into the half-forgotten routine of his normal life. Both loved the man; therefore they were instinctively tactful.

On arriving on the Mountain, they had taken him first to the hutch, although it was no time of day for anything to be doing there in the normal course of events. It was a hard, bright afternoon, with a hag of a wind shrieking over the desolate mountain tops.

"Let's have some coffee," Dakan suggested, switching on the current. "Miss Douglas, you're elected chief cook. Muffins for me."

While Kate busied herself about the range, Dakan unobtrusively kept an eye on Hardinge. The broken man looked about him, sighed gratefully, and made his way to the range.

"This is jolly," he said, warming his hands over the glowing plates. "It's not half bad to be home."

The conspirators exchanged a significant glance, and Dakan nodded. Kate followed the promising lead.

"Pobby isn't here to mess up the coffee," she remarked cheerfully, "so we shan't have slops."

"Isn't he?" Hardinge replied absently, after a troubled pause. He frowned desperately. "Where is he?"

"Off on a jaunt," Dakan responded indifferently. "He left the same night that you went into Los Angeles. I can see him yet, bowing his blushing thanks to the assembled diners."

Kate had forgotten her duties. The muffins she was supposed to be toasting charred odorously. Her eyes were on Hardinge, the man she worshipped, and the man who, she believed, alone could save the generous foundation which made her perfect life possible. He had strayed away from the range, to slump down in his accustomed seat. His clasped hands were rigidly tented on the white aluminum before him. They watched him in silence. His whole shattered memory struggled in his face. Suddenly, to their shocked pain, his head fell upon his arms and his shoulders shook.

"Don't bother," Dakan consoled, laying a hand on his tousled hair. "What the devil does it matter if you can't remember? Come on; Kate's got the muffins done—or rather, overdone. Let it go. We can wait. She must toast another dozen."

Hardinge sat up, his eyes haggard. He faced Dakan.

"Ask me something that I should know. Something hard."

"In science?"

Hardinge nodded. Dakan carefully framed an intricate question, and posed it deliberately. Hardinge's response was instant, concise, and accurate.

"Ask me a harder one," he begged.

"Sorry," Dakan confessed, "but I can't. Miss Douglas, you try."

"I'll not spoil this batch of muffins," she laughed, "for any silly intelligence test on earth. Here they are. All buttered. Eat them while they're hot. Mr. Hardinge! How many times have I told you to use a napkin, or a towel or something when you eat buttered muffins?"

For half an hour they talked and laughed without restraint. Kate stacked the plates and cups in readiness for the dishwasher.

"Shall we go?" she asked, with a meaning glance at Dakan.

"We may as well," he assented. "Better put on your coat, Hardinge. It's blowing great guns outside. Here; I'll help you."

Kate buttoned herself up, and they passed into the shrieking gale in the hard blue afternoon blaze.

"We had better cut right down to your cabin," Dakan bawled in Hardinge's ear. "This breeze is the limit."

Hardinge shouted back something which they did not catch. They did not care; their eyes were following his feet. Without a single false step he preceded them to the side door of his cabin. Fumbling for his keys, he realized that he had been away, ill.

"They rooked all my tools from me at the hospital," he shouted over the howling wind.

Dakan started down the trail toward the central office, to get a passkey, when Kate yelled—there is no gentler word for her effort to quell the gale—him back. While Dakan and Hardinge watched her in awed fascination, she nonchalantly picked the safety lock with one of her two precious hairpins.

"There," she panted, when finally they found themselves in the sitting room. "Why do people make locks?"

"The police only know," Hardinge ejaculated, with an admiring glance at Kate. She was thoughtfully straightening out her hairpin. As naturally as if it had been the same time of day weeks ago, she asked:

"Shall I take it down?"

HARDINGE'S face became the picture of misery. Without replying, he walked to his desk, pulled back the chair, and slumped into his habitual position.

"Yes." He rubbed the back of his head, where the fracture had long since healed. They watched him in silence. "Let me see. Yes. That was it. Where is the slide rule, Miss Douglas?"

"In the second side drawer at your left. Shall I get it for you?"

"Don't bother. Dakan. Dakan—"

"What is it, old man?"

"Did you give me a drink?"

"A good stiff jolt of brandy, if that is what you mean."

"It made me ill, didn't it?"

"I rather think it did," Dakan agreed. "But you asked for it, you know."

"So I did. So I did. Where is that slide rule?"

"Here." Kate laid it before him. "Do you want the figures you asked me to take down?"

"Figures?" he repeated.

"'Ten millimetres; four metres; star'," she quoted instantly.

"Exactly. Thanks." His long, nervous fingers set the slide rule, as he calculated mentally. To their astonishment he looked up and spoke with perfect rationality. "Do you know," he laughed, "I believe I'm slightly cracked, and I know you think I'm still out of my head. I am, of course. All that messiness in the hospital is as clear to me as you two standing there are now. I remember everything. Everything, that is," he added jestingly, "except what I am trying to do now.

"Can't you help me out? I understand my own case as well as you do, and better than the psychiatrists and nurses did. Whatever hit me, merely made it easy for me to forget the unpleasant incident. I am rational, I am positive, and I am not insanely rational. The most natural thing in the world would be for me to forget what I was doing when I was struck. You understand, don't you?" he implored.

They nodded. "Quite natural," Dakan soothed, "according to the psychologists."

"Quite! But don't say it like that. I'm not a 'case.' Can't you two help me to remember what I was trying to do with these figures?"

Dakan glanced at Kate. She replied, briefly but sufficiently.

"You were trying to trace the stolen hydrogen-helium series of plates."

Hardinge's fingers almost made the slide rule speak. But not quite.

"The answer is here," he said. "There was a book, too. 'International Guide—' I can't remember."

Dakan began stealthily searching the room, while Kate suggestively wrote out a slip with the figures 10 mm. 4m, ★, and placed it on the desk. Hardinge watched her closely.

"You are helping," he said. "Wasn't there an accident in the dining hall?"

"You spilled the soup," she said.

"Ah!" he exclaimed. "Do you remember?"

"Of course. Bhattacharyya was outraged."

"Who else sat there that night?"

"Mamoulian, the South Americans, Laramie—the usual crowd of late comers."

"South Americans?" he queried in bewilderment. "That's strange. The plane headed for the Mexican border."

"What plane?" Dakan demanded quietly, coming up behind them.

"This one, of course," Hardinge expostulated, as if the matter were one of common knowledge. "Ten millimetres, four metres." He stopped, baffled. "What was it, Kate? Octagon or star?"

"Star."

"Exactly. Now I begin to remember. Who was at that table?" he asked again.

"The usual crowd of latecomers," Dakan answered casually. "Anyone in particular on your mind?"

"Yes. Not an American. Who—"

He was interrupted by the shrill, penetrating whistle of an upper lane express zipping down to the landing stage. He rushed to the door, and darted out into the howling dry wind before they could stop him.

"Let him go," Kate cried, as Dakan started to follow. "This is the link to close the chain. Don't you remember how you and he waited for Merriman that night? He is beginning to remember!"

"Yes," Dakan shouted, to make himself heard above the yelling wind, "but I must see that he isn't blown off the mountain into the desert. He only half knows what he is doing."

She staggered after him into the smiting wind.

CHAPTER XII

Pobby's Progress

POBBY had now been over twelve weeks on his tour of inspection. Everywhere, thanks to Merriman's thoughtful foresight, he had been shown the gravest courtesy, and all directors of metallurgical research, from Los Angeles to Lima, from London to Calcutta, from Cairo to Pekin—in fact everywhere on his zigzag flight over the habitable parts of the globe—had shown him the most respectful consideration. Another three months of this, and his inferiority complex must almost inevitably be resolved. After the twentieth honorary degree—delicately suggested by Merriman—Pobby began to feel quite proud of himself.

Everywhere he went he was received with open arms, not to say with gaping mouths. They hung upon his bloated erudition like leeches upon a tropical donkey's belly. His voluminous reports threatened to swamp the dismayed Merriman's London office. By every mail they arrived in quartos and octavos, in the flat and in the round, in tin cans (to withstand tropical moisture), and in bamboo cylinders—in every conceivable container and script, in fact, that a luxuriant self-importance could suggest. Merriman ruefully filed them all, barely scanned or honestly unread, and wondered why on earth he had ever suspected the artless Pobby of being anything but the multitudinous ass he was.

The spree of this Consulting Metallurgist At Large was costing like the very devil. As yet the highly paid International Private Police—world detectives, in short—had caught Pobby in nothing more scandalous than trying to waken the slumbering soul of a half-breed Peruvian lady of the town to the maternal career which, Pobby declared, was her true profession, although she herself had never suspected it.

Pobby, being himself the pink of prudery, never could understand why all the damsels of the second kind whom he tried to divert on his travels, greeted his honorable efforts with ribald laughter. The observant secret police reported irritably that they were getting fed up on trying to catch this modern Sir Galahad in a peccadillo. Pobby, they declared disgustedly, was incapable of sin. Why waste good money on such a sap? He neither stole nor lied, got drunk nor, etcetera, etcetera. He merely orated.

Pobby speechified on all occasions, with or without provocation. What he said at such-and-such a banquet in his honor was faithfully recorded, long after midnight, and forwarded by special mail to Merriman at the London office. Every word he generously exchanged with street cleaners, bellboys, casual loafers, and farmhands encountered on hygenic strolls or, in one memorable report, when he was only seven weeks from home, with a disreputable old harridan of eighty who, wrinkling up her shiny black face like an amorous monkey's, quoted the Song of Solomon at him from the bank of a muddy irrigation ditch in central Africa, was meticulously reported.

Merriman actually read that report

two days later. An observant young secretary had seen this glittering gem while raking over the general garbage pile, and had silently laid it before Merriman. The "big chief" whooped and roared with delight. Then, pressing a button, he summoned his personal secretary.

"Give the girl who brought me this," he directed, "a good raise—say double her present salary. That young woman knows her business."

Almost at the very instant that Merriman was chortling over the episode of the aged wench, Pobby was robustly endeavoring to keep himself in fine physical fettle for his important task. Under the brazen heat of a lowering subtropical sky, he strode manfully along the main dirt road which led, by a sort of back-alley shortcut, from the city where he was tarrying, to the nearest important town in the vicinity.

On either hand lush fields, shriekingly green with their midsummer crops, invited the pudgy wanderer's heavy eyes and infinitely heavier limbs to rest. Pobby had been up nearly all night, writing to Merriman. The native guide, whom the hotel manager had insisted on foisting on him lest he get lost, was, Pobby admitted to himself for the hundredth time, little short of a damned nuisance. How could he slip into one of those green fields and let his weary legs turn to nerveless jelly while he slept, without incurring the contempt of that wooden-faced fool who kept dogging him like a diseased conscience? If only the pest would stumble into the irrigation ditch bordering the road and drown, Pobby could slumber to his heart's content and his legs' refreshment without shame. But the stupid oaf stuck to him like a dying fly.

The oppressive humidity grew stickier and stickier. The blaring green fields fairly yelled their invitation to sleep and forget all things for two blessed hours of oblivion. Before he knew what he was about, Pobby realized that he was already nine-tenths asleep in a steaming bed of Paris-green vegetation.

The faithful guide crept into the shadow of an exceptionally tall clump of the rankly growing stuff, and mounted guard. His rigid instructions ordered him not to let the sleeping man out of his sight for one second. Composing himself comfortably he sat like a frozen stone with his eyes fixed on Pobby's spraddled legs.

It was an excessively humid day. To remain motionless and awake for any length of time on such an afternoon was beyond human capacity. Presently the detective's snores were rhythmically reinforcing Pobby's.

While the two slumbered, watcher and watched, as innocently as the twin babes in the paddy field of oriental folklore, the brutelike toilers of the fields kept steadily at their work. Their fathers for countless generations had worked as they were working now—not in the sweat of their faces, for the stifling humidity made sweating impossible—under the dull copper clouds of midsummer skies without number.

THEY had never questioned their destiny, their brutal present or their dishonorable past. Had they been gifted with anything less common than strong backs and filial piety, they might have guessed that they were just so much human protoplasm, without minds, without souls, damned for generation after generation to back-breaking manual labor, infinitely lower in the scale of life than the unliving machines which they were too stupid to use, and which they would have considered it impious to use had they had the necessary rudimentary mechanical skill to understand them. Here was humanity at its zero.

A dollar watch, guaranteed to run for a year, was worth more than a million of these human vegetables that rotted out their sixty or seventy years fertilizing and tilling the soil that any competent machine, manned by a single human brain, could have farmed with twice the efficiency. Here, in the fecund fields, was the last stronghold of immemorial conservatism and the despair of world statesmen. With this dead mass of half-human matter on its hands, how could any race hope to raise itself to a human level?

While Pobby and his unsuspected guard slept, the slow human machines worked gradually toward their secluded corner of the field. The strong-backed ones were ripping up the succulent crop by its roots, working methodically along the troughs of the shallow irrigation channels. With grunting tugs at the

obstinate roots they blindly bored their way down toward the sleepers' verdant bower.

Presently one of the oldest laborers, a man of perhaps sixty or sixty-five, paused in his everlasting bend-and-pull, tug-and-rip, sat down in the mud of the ditch, and scratched furiously at his left ear. It was not the first time that day that he had desisted from his instinctive labor to scratch his ear. The itch was persistent, like an encysted, growing maggot. It seemed to be localized inside his cranium, on the under side of the bone, just above his ear.

The unscratchable itch seemed to cause its victim the extremest misery. He groaned—a pathetically human thing for a barely human machine to do. Then he became silent—ominously silent. Any physician of a civilized people would have decided that the aged man had gone dangerously mad. His brutal fellow workers kept steadily at their brainless labor. Their fellow man's distress meant nothing to them. It was the foreman's job to see that all worked, not theirs.

Before any of them fully realized what was happening, the aged machine of sixty had torn the life out of six of them with his naked hands. That an old man could rip out the windpipes of six sturdy young machines, not one of whom was over twenty-five, with his bare fingers, seemed little less than a miracle of the gods. They fled yelling, to inform the foreman, who had seen the fracas, and met him half way to the scene of the miracle. When they reached it again, they discovered their aged fellow shoulder deep in the silty mud of an irrigation trench. He had ceased to breathe, and the hellish itching of his brain was written off forever against his debt to the human race.

The chattering of the survivors woke Pobby and his drowsy guard. The short, sharp screams of the murdered six, as their windpipes were ripped loose and snapped by the madman, had not lasted long enough to disturb the feverish nightmares of the sleepers, nor had the yells of the survivors broken their soggy sleep. This, however, was a debate.

The foreman voeiferously believed that six violent deaths and one suicide should be carried at once to the annoying health officers, who were always insisting that the men boil their water and report every case of sudden colic. The foreman's orders, in fact, compelled him to notify the federal physician at once in case of severe sickness. Was death a serious sickness? That was the topic at issue. The innate stupidity of the human mind is a perennial miracle.

Pobby twitched. The wet heat still clung like a steaming blanket to his aching legs. He twitched again, more violently, and was instantly discovered.

The hapless foreigner was at once convicted in the foreman's rudimentary mind of both murder and suicide. What were he and his companion doing in the field? As Pobby could understand nothing the irate foreman said, he was unable to give him any satisfaction. If the detective followed the foreman's remarks—which most probably he did—he considered it wiser to make no reply. Pobby turned on him in exasperation.

"You're a guide. Why don't you answer the man?"

The detective shook his head stupidly. In his rôle as hotel guide, he was not supposed to understand English. The manager's agent had merely told him, in his own language, to see that the distinguished guest did not lose his way on his proposed stroll to the nearest considerable town. The detective now took the line of understanding neither English nor the degraded dialect of the agricultural laborers. It was a good safe course to follow.

NEITHER Pobby nor the detective expected to be detained for more than a general cursing. They were outraged therefore when four brawny laborers seized them by the arms and hustled them off toward the town that Pobby had set out to reach. Kicking and shouting availed them nothing. The detective began swearing at himself for having played the deuce when he should have put down his ace.

It was a queer procession that crawled into the drab town in the stifling humidity of late afternoon. The foreman, conscious that the great moment of his life had arrived, stalked pompously down the middle of the main street, his head disdainfully up, and his half-naked chest thrust manfully out. Behind him slumped the prisoners, now

thoroughly subdued.

Pobby's elegantly pointed beard hung from his cheeks and chin in bedraggled strands like wilted corn silk. The detective was trying his hardest not to think of the unpleasant possibilities ahead. The police, he knew, were efficient to an uncomfortable degree. He would be searched from hair to heels. His international identification tag must inevitably be discovered. Then he would be forced to enlighten Pobby why he was on the job. He did not know himself. But he was keenly conscious of the drastic orders of his chief in London. At the cost of his own life, if necessary, he was to conceal his identity as an officer of the international secret service from the man he was shadowing.

As he shuffled up the depressing street, he seriously contemplated suicide. To fall down in this shameful way meant professional death. He would be instantly dismissed, with no possibility of appeal. Why, oh why, had he dozed? And why in the name of reason hadn't he used his wits to talk the foreman out of taking them along? The terrific heat and the soggy humidity had stifled his mind. But, he reflected bitterly, he had no business allowing his mind to be stifled. There came a ghastly hiatus in his thinking. Then, plodding after the foreman, "I deserve death," he thought, "and I hope to God I die."

Behind the prisoners, a grisly troop stalked solemnly ahead. These were the bearers of the dead, all seven of them. On the muddy, frozen face of the old man who had slain the other six, a tortured grimace of agony still lingered.

The tail of the procession consisted of a shambling assortment of shuffling hobbledehoys—the full contingent of all the laborers under the foreman's charge. These were the witnesses, although the majority of them had seen nothing but mud and vegetation for the past twenty years.

At last they reached the Station of Public Safety, as the police and sanitary divisions of the public service pompously styled themselves throughout the land.

A white-uniformed orderly received them. One glance sufficed him. He pressed a button to summon the chief.

The chief came. He calmly gazed on the stiffening bodies without the least flicker of emotion on his impassive face.

The six with ripped windpipes did not interest him. He passed them with barely a glance. Coming to the seventh, he sharply halted. In his own language he gave a short command to the orderly. The man hurried out, to return presently with two male nurses and a grave, elderly man whose uniform proclaimed him as a surgeon. They were fully prepared for emergencies.

The surgeon ordered the nurses to spray the head of the dead maniac with antiseptics. This done, he held out his own hands for the spray till they were dripping. Then he began a brief examination of the dead man's eyes, tongue and scalp.

He straightened up, and reported in three staccato sentences to his chief. Even Pobby began by now to realize that something very much was up. He all but fainted on the spot when, of all the surgeon's barbaric jargon, he recognized one word, meticulously enunciated.

The word was "California."

Pobby flew into a not unreasonable panic. How on earth had these hygienic police officers guessed that he was from California? Were they actually accusing him of the old man's ghastly death? But the aged machine had committed suicide; Pobby himself had seen the foreman pulling him out of the ditch, and he remembered vividly the disgusting gurgling suck of the silty mud as the old man's head—but it was too horrible even to think about. Pobby could swear he hadn't murdered the man. He must get into touch at once with Merriman. The big chief would have him safely in London before daybreak. Gesticulating madly, Pobby made it plain to the nurses that he wanted to use the radiophone.

They shook their heads. It was already in use. The surgeon was coldly calling someone. A short, sharp order crackled from the speaker of the radiophone in response to the surgeon's call.

The chief pressed a button. In less than half a minute, Pobby and the detective found themselves under arrest with the dumb crowd of brutish laborers.

It was then that the detective, frantic with fear at what he had overheard and understood with appalling clearness, found his tongue. For two torrid minutes he expostulated with the chief, frequently pointing to Pobby. The chief's

face might have been that of a terra cotta Buddha. He made no reply whatever.

PRESENTLY the swish of a descending helio racer was heard in the white-tiled room. The detective's face became a mask of hopeless resignation. He had implored and had been denied the privilege of communicating with International Police headquarters in London. Understanding the surgeon's report, he had confessed his identity to the chief.

They were hustled up a spiral stairway to the tiny landing stage on the roof of the building. Laborers, the dead and the living, all, were treated with but scant ceremony.

Arrived on the landing stage, the detective turned to Pobby.

"Ask the chief," he said in faultless English, "to allow you to communicate with Merriman."

Pobby nearly fell down.

"You know English?" he sputtered. "You know Merriman?"

"Yes, and I know you. I am S 217819 of the Zedten Division of the International Secret Service. I do not know why I have been ordered to shadow you. All—"

"To shadow *me?*" Pobby demanded, his eyes rounding.

"There is no time to argue. Use your influence with Merriman."

Pobby approached the chief. The detective followed, and translated, a sentence at a time, Pobby's frantic appeal.

The chief stood motionless. For any sign that he gave, he might have been deaf.

"Try again," the detective urged. "You don't know what is ahead of us. These people are as callous toward dangerously infected persons as they were three hundred years ago to prisoners of war. Try—"

Pobby had no chance. The living laborers and the corpses were already aboard the racer. He and the detective were hustled after them; the chief and the surgeon followed, and the pilot prepared to rise. The chief gave the order.

Before they realized that they were aloft, they had landed. Stepping from the cockpit, Pobby stared about him. His face broke into a broad smile behind his bedraggled beard. This was precisely the spot he had intended to reach when he set out on his stroll. It would be all right! In two minutes he could report to Merriman, just as the detective desired. *He* wasn't infected.

" 'God's in his Heaven,
All's right with the world!' "

he chortled as he capered after the detective.

The colored photographs of the hideous courtyard had not slandered its utter lack of beauty. Pippa Pobby recognized—or thought he did—every ugly glazed red or white welcoming brick of the whole impossible quadrangle as an old and trusted friend. This was the very laboratory, the main one of all this backward nation, which he had planned to visit that afternoon and "inspect" for its metallurgical possibilities. Merriman's cordial introductions were even then nestling in their humidity-proof oilskin envelopes in his breast pocket.

A word from him, and all would be more than well. The customary banquet, followed by the usual honorary degree, would be duly offered, accepted and bestowed. Then he could have it out with that preposterous, excitable detective, S 217819 of the Zedten Division of the International Secret Service.

Suddenly Pobby realized the full import of S 217819's presence. They suspected him at the Observatory of having stolen the hydrogenhelium plates.

He went a livid green, and tottered after the aged corpse being borne toward a side door of the forbidding laboratory. How on earth had Merriman ever suspected that he knew of the theft? Poor Yandell's honors of his triumphal progress suddenly seemed to drop upon his shoulders and sag in tattered rags about his trembling knees. If only he could reach a radiophone to communicate with London, he could set himself right, or at least gain a blessed respite before his just sentence overtook him.

Suddenly he was gripped by a sharper fear. What if he failed now in his self-appointed task? The thought drove him frantic. He clutched at a guard's arm, babbling incoherently in English. The guard brushed him aside. Pobby found himself, herded ignominiously with the detective and the hobbling laborers, in the cool antechamber of some aloof mogul's sanctum.

"Ray Merriman!" he shouted at the crushed detective, not exactly knowing how the impossible was to be accomplished. A guard shook him, severely. Evidently he was to hold his tongue. The detective was similarly reminded of his place as he struggled to reply.

In fascinated horror, Yandell watched the next act of the drama unfold before his eyes. Three men, evidently surgeons, swathed to their eyes in the regulation white of the operating room, advanced to the corpse of the madman. Their attendants followed with instruments. The corpse was drenched in antiseptics.

In a silence that could have been heard the surgeons performed their autopsy. A microscope was called for and brought. One of the surgeons smeared his rubber glove over a rectangle of glass, while his companions began preparing a more scientific slide of the gray matter of the dead man's brain. The surgeon at the microscope held up his hand. He had seen enough. Further slides were unnecessary.

A bulb glowed on the western wall of the chamber. The surgeons were signalling their head.

HE came in person, within thirty seconds. There was a brief parley. The head himself peered through the microscope. Rising, he uttered a short sentence which contained one word that Yandell understood. Again it was "California."

Pobby began to shout, or rather, to shriek. He was instantly silenced, effectively. The chief of the surgical corps was already engaged with the radiophone.

The detective had found his voice again. Before they could restrain him, he had shouted his barely intelligible warning.

"Merriman! Life and—"

Yandell understood, instinctively. He hurled himself free of his guards and fell against the chief surgeon's side. In a babble of incoherent words he proclaimed his identity, and backed it up with a free and full exhibition of all his credentials. This laboratory, he explained, was one of those which he must inspect on his tour. Indeed, he had been on his way to interview the president of this famous centre when he was rudely arrested.

The surgeon listened. Better, he scanned the credentials.

"I will see," he said in English, with barely the trace of an accent. He strode to the keyboard, pressed a button and waited. Then, in his own language, he reported. There was a significant pause. At last the chief surgeon turned to Yandell. "You may follow me."

In a dream Yandell followed the chief surgeon into a severely plain waiting room. The laborers and the detective had already preceded them.

Barely conscious of what he saw, Yandell noted the dumb group of tired laborers staring like cattle at their unfamiliar surroundings. The detective stood slightly in advance of them, chattering like a parrot gone mad at an impassive man seated at an ironite desk.

Yandell was thoroughly familiar with modern scientific apparatus in most of its important forms. His eyes fastened on two tiny switches and their registering signal globes on the ironite desk of the man whom the detectives was striving to move. His blood congealed. It would be painless, he knew. But death—. That was a thing to be rebelled against while life lasted. He strove to free himself, and was instantly controlled and silenced.

The haggard lines on the face of the man at the desk seemed to grow deeper. Raising a hand, he checked the detective's impassioned plea.

"You have done well," he said. "Not many have held duty before them as you have."

"Is this—" the detective began.

"It is," the man at the desk finished. "We shall accord you all the honors which we are about to confer on these lowly men." He glanced at the guards. "In there; I will address them from the balcony."

As he passed the metal doors of the sound proof chamber, the detective freed himself and darted back to the desk before the guards could recapture him. Yandell was being dragged to the hall of honor.

"This is Yandell," he cried to the impassive man, who sat frigidly at his desk with his fingers on the tiny switches. "Merriman will have you executed if—"

He did not finish. The guards bore him off his feet and carried him kicking to the door of the hall of honor. In two

seconds he had rejoined the human clods he had sought to abandon to their mercifully undeserved fate.

Yandell, realizing what was about to happen, looked back and yelled.

"I didn't—" he screamed.

CHAPTER XIII

The Front Line

WHEN Merriman and the International Police Chief stepped onto the landing stage at the Observatory, they were met by Hardinge, who insisted that they accompany him to his cabin. Through the howling gale they made their way as quickly as possible to the cosy shelter. Kate and Dakan had waited.

"Feeling better?" Merriman asked.

Hardinge nodded. "Give me time, and it will all come back."

"Take all the time you need," Merriman encouraged. He turned to Dakan. "It begins to look as if your suggestion is going to be the practical one after all. The chief here has told me of an outbreak of some sort of blight on the midsummer rice crops in Zedten."

"It sounds bad," Dakan commented soberly. He felt strangely uneasy.

"In more ways than one," the chief agreed. "It seems that the outbreak was not regularly reported to the world health officers."

"They've been trying to hide it?" Dakan suggested.

"Apparently. I shall go out myself to investigate as soon as I have consulted Castellani. Merriman thinks I should see some material of his first."

"Is it as serious as that?" Dakan asked Merriman.

"We hope not. But we must be prepared for everything. What about a wash and some dinner? I'm going on to Zedten with the Chief. We should start as soon as possible."

"Dinner will be on in half an hour. Is there aything I can do in the meantime?"

"Call Castellani, and tell him we will be down in about an hour."

They all met again in the lounging room a few minutes before the dinner signal. Hardinge withstood quite an embarrassing seige of congratulations on his recovery from his "digestive upset," and was counselled not to patronize the Cosmopolitan table in future. That, they declared, was the cause of all his trouble.

Passing into the dining hall, Hardinge laughingly declared that he would sit with the late comers just to break the spell. He did.

Deliberately trying not to think, he let his subconscious mind work in its own way. Presently he found himself stealthily wrapping the loose corner of the tablecloth around his left knee. What was he doing that for? It all seemed in keeping with some strangely familiar plan that he could not recall. The soup was served. Bhattacharyya as usual asked whether there was meat juice in it. There was not; it was pure split pea soup. Just as the Brahmin sipped his first spoonful, the entire forgotten incident flashed like a photograph on Hardinge's mind. The whole memory had come together at last with a snap. With difficulty he restrained himself from jumping up there and then, spilling the soup once more, and dashing for his cabin. He sat through the dinner in a dream, not knowing what he ate or what he said.

On the way out, he intercepted Merriman.

"It has all come back," he exulted, his eyes brilliant. "By tomorrow morning at the latest I should be able to give you some definite clue to work on. How can I reach you?"

A short critical inspection of the excited face before him convinced Merriman that Hardinge was in his right mind.

"Good!" he exclaimed. "Things are likely to become serious at any moment now, if the rice disease is new, as the health officers seem to think. Perhaps the simplest way would be to ray our special. The operator can stay with his instrument wherever we land."

"Won't it be dangerous? What if we are overheard?"

Merriman beckoned to the Police Chief and briefly explained the situation. The chief had a solution.

"Strictly," he said, "I am not supposed to do this." He took a small, thin steel-bound book from his breast pocket, and handed it to Hardinge. "However,

this may be a crisis, and we can't hobble ourselves with red tape. That is the International Police emergency code. I know it by heart. You will see at a glance how to use it. And you had better destroy this copy as soon as you have finished with it."

Hardinge slipped the slim volume into his own pocket, glancing warily about him. Merriman noted the suspicious survey.

"You're right," he said. "For Heaven's sake, take no chances this time. Lock your cabin door, and get Dakan to stay with you till you burn that book."

Hardinge laughed. "Once is enough. I shan't take Dakan's time—he is right in the middle of measuring his final plate from the N. G. C. 84 region. Would it shock the Governors out of a year's growth if I were to ask Miss Douglas to share my vigil?"

"Tush!" Merriman responded good-humoredly. "That's only an unwritten rule anyway. If you like, I'll ask her before I go to keep you company."

"Please do."

MERRIMAN hastened over to Kate, and delivered the official sanction. "Now do be careful," he admonished, taking his leave. "Lock the cabin door, and have your hands on the dials every second of the night."

"There is danger, you think?"

"I believe you will be perfectly safe. But what happened last time?"

"And if there is danger? Whom shall I call?"

Merriman considered. "I'll tell that lazy beggar of a flier to be ready for emergencies. He is just going to spin the chief and me down to see Castellani for ten minutes before we take a high-level special for Zedten. He will be within four minutes of you all night after eight o'clock."

Merriman and the chief were duly dropped through the howling desert storm—the worst in years—and found themselves confronting the Superintendent of the underground laboratory. The Superintendent had not tarried to receive them in his office with the usual formalities and courtesies. He was already in the storm chamber when the helio racer entered. The Police Chief noted an excitable little man dancing behind the superintendent like a foraging mosquito.

"Castellani's here," Merriman remarked significantly. "The situation must be serious."

It was. Just before the helio racer took off with Merriman and the chief, from the Observatory, the Superintendent, preparing in his office to receive them, had been startled by a sudden deluge of orange light. It flooded the room, and flashed off. Again the white-tiled walls were drenched with the ominous orange light. The signal was repeated five times. Five; that meant a branch of the world service and an alarm.

The Superintendent strode in a daze to the radiophone. He remembered as in a dream, as part of his training, that "five orange" was the signal of a general alarm to all the world forces in biology. Never, so far as he recalled, had there yet been occasion to send out such an alarm. His rigid training triumphed, and he automatically adjusted the speaker of the radiophone.

"Zedten National Headquarters of International Health Service calling through London. Do you hear? Do you hear? Zedten Headquarters—". The Superintendent depressed a switch, and answered.

"I am listening."

"Identify yourself. Identify—"

"L 817 on the A. B. C. code."

"I am J 2. Send Castellani to us at once by high-lane express. This is Zedten Health Headquarters, transmitting through London, as officially required by the code."

"Right. What—"

"Hold your entire staff in instant readiness. Grant no leaves of absence."

"Right. But what—?"

He was cut off before he could finish his question. Not stopping to speculate—so ground in had been his training—he instantly summoned Castellani.

The diminutive Italian came, literally in his pyjamas. He was an all-day worker and an all-night sleeper.

"Get dressed," the Superintendent ordered. "Merriman and the International Chief of Police will be here in four minutes. Get into your clothes."

"But why?" the little man protested.

"General alarm."

"Biological?"

"Yes."

"My God!"

Castellani darted out, fearing nothing in particular and everything in general. This, so far as he recalled, was the first time in history that a general alarm had been rayed from Biological Headquarters. What on earth could be the matter? He was adjusting his cravat—Castellani always dressed with scrupulous care, even in emergencies—when a ghastly guess turned him suddenly sick. What if that filthy new disease of the oriental cockroaches were abroad in the world? No wonder there had been a general alarm. Abandoning the nicer points of his fastidious toilet, he rushed to the Superintendent's office.

"They have come," the Superintendent greeted him. "The call globe just glowed."

He hustled the little man out with him to greet the opportune visitors. Almost before he knew what was happening, Castellani found himself between Merriman and the Police Chief in the racer. Three minutes later, he was guided—or rather lifted—into the airtight passenger compartment of a high-lane express on the landing stage of the Mountain. A respirator was rudely slammed down over his face and strapped abut his head and chest. This was to be a swift ascent to the seventy thousand foot level.

THE sicknening nausea of the rocket climb passed quickly. The steward, having seen that the oxygen generator was functioning efficiently, removed the passengers' muzzles and carefully regulated the air pressure.

They were up among the stars, it seemed to Castellani staring up through the quartz skylight, and absolutely at rest. This was his first trip on a really fast express. He would enjoy it, in spite of general alarms. For what is man beneath the stars? For twenty minutes he lay back on the well-worn leather cushions and surrendered himself to all the luxuries of a millionaire's everyday life.

One after another he recognized the superb constellations as they swam into the unfathomable sapphire of the night sky, hesitated for a fraction of a second over the rocketing express, and dwindled like feeble sparks down the void immensity. In that absolutely motionless, all but void atmosphere, the stars neither flickered nor twinkled. They blazed. Cold and clear as fiery lumps of ice, they seemed to gather up into themselves all the undiscovered flames of a white-hot firmament forever beyond the feeble knowledge of mankind.

Gradually the absolute brilliance of the starry sky passed. The sun was not rising, as we stay-at-homes would put it; the helio express was raising the sun. More than a third of the way round the globe already, the speeding express had overtaken the sun, just where west becomes east, and east merges into west. The star of our planet was neither rising nor setting. Should the express land now, the passengers would be puzzled to say whether it was dawn or twilight that lingered rosily on the clouds. But the express did not land. Half a continent floated far behind it before it dipped to the sixty thousand foot lane, and, five thousand feet at a glide, began skimming toward the earth's surface.

The steward busily adjusted the air generators, and again muzzled his patient passengers. Within two minutes they would be at the ten thousand foot level and natural, icy air.

Like a clap of thunder the scarlet and orange dawn broke over the express as it cleft the cold mists above a limitless plain. Innumerable mean villages and bristling towns rushed up to meet them, and to remind at least one of the three that the swarming bacteria which we call humanity is of more importance than all the dawns that ever shattered their crystal over this earth. So thought Castellani, the humane biologist, in his not unreasonable self-abasement as he stepped from the glorious bird of night onto the drab gravel of a depressing courtyard. The glazed red and white tile of the superbly hideous sixty story laboratory filled him with a sudden, overwhelming disgust.

He was here to fight some disease of these human ants who had laboriously constructed all this depressing pile. Was it worth the effort? Why not let them become universes of prolific fungi? He felt a friendly hand on his shoulder. Turning, he looked up into Merriman's smiling face.

"Your first high flight, Castellani?"

"My first."

"It gets us all," Merriman laughed,

"till we become used to it—just like everything else. I shall never forget the first time I heard Beethoven's ninth symphony. One's first sight of the Southern Cross rushing up out of nothing and vanishing is rather like that. Well, here's the official reception committee, all in their white robes. It must be serious. I'm going to insist on breakfast before we start—although I've just had dinner."

"A cup of coffee," Castellani began.

"I know," the chief seconded. "Practical as I am, these quick night flights always make me feel about a million years old. Day and night get all mixed up."

"Also time and eternity," Merriman added, not altogether in jest. "It makes us feel as small as we are. Coffee, as Castellani suggests, or some other trivial human necessity, is essential for bringing us back to earth after one of these flights. Just think," he concluded, "Kate and Hardinge have barely started their night's work, and here we are, hungry for breakfast."

The local head surgeon was already welcoming them. The reception was extremely formal, and equally brief.

"You are the International Chief of Police?" he asked finally, addressing that individual.

The chief nodded. "Yes. What have you to say for yourselves?"

"We were not expecting you," the head surgeon replied evasively.

"I know damned well you were not," the chief retorted sharply. "That's why I came. I was on my way here when Mr. Merriman and I ran into your call to Castellani. What's up?"

"You must see the president."

"I shall. As soon as I have had breakfast. Take us to your lunch room, or whatever you have, and see that we are served at once."

"You seem to mistake my identity. I am not a steward—"

"Who said you were? Do as I say. When you have seen that we get breakfast, I will speak with your president. All of you are guilty of criminal neglect of duty. Tell him that I will see him in ten minutes."

IN stiff silence the chief surgeon conducted them to the lunch room of the laboratory, and stood by aloofly in a corner until they had swallowed their coffee.

"The whole atmosphere is wrong here," the chief muttered between gulps. "This man hasn't even suggested that we see the International Health officer supervising the zone."

"Perhaps he is the man," Merriman suggested.

"I'll ask him. Here!" he beckoned to the motionless figure standing patiently in a corner.

"You called?"

"I did. Who turned in that general alarm?"

"You must ask the president. I have no authority to speak."

"Who the devil are you, anyway?"

"Head surgeon of the health service."

"And it was on your suggestion," the chief shrewdly suggested, "that the president of the laboratory reported to London?"

"I believe so."

"You believe? Don't you know? Here—ask that girl to bring me another cup of coffee." The chief was neither thirsty nor gluttonous. The coffee was brought. Merriman and Castellani sipped their drinks as carelessly as they could. "You believe, but don't know. Is that it?"

"I have said so."

"Why did you advise your president to communicate with London?"

The head surgeon made no attempt to conceal the truth.

"Because our president," he said, "is a headstrong man."

"It was he who ordered you men to suppress the first reports of the epidemic?"

"Yes."

"Then how did you finally prevail upon him to report, as he should have done in the first instance?"

"By suggesting that he report the symptoms to London headquarters."

"What symptoms?"

"Epidemic insanity, chiefly. Necrosis of the nerves, secondarily."

"Insanity?" the chief echoed. "But we were called here to mobilize against a disease of the rice crops."

"London headquarters are giving out that alarm merely to allay undue uneasiness."

"There is no disease of the rice crops?"

"There is. The crops are rotting. Everywhere. That is why we requested Dr. Castellani's presence."

"You mean you and the president?"

"I, chiefly. He would prefer to fight the disease in secret, as he has fought it for nearly eleven weeks now."

"Eleven weeks?" Merriman echoed, with a significant glance at the chief. "Why didn't he report?"

"I cannot say. Our president is a great man, a hard man."

"He tells you nothing?" the chief suggested.

"We all work to one end," the head surgeon replied evasively.

"No doubt. So do we, on the other side of the globe. We are even working with you," he emphasized, "although you men always play up your ancient inferiority complex against our occidental civilization. So you took it upon yourself to inform International Headquarters in London of this mysterious rice rot? Why?"

"Because," the chief surgeon declared as impassively as if he were reporting a baseball score, "eighteen thousand have been cremated in the electric furnaces of this laboratory alone in the past twenty-one days. In the fields, at least three times that number have been destroyed."

Merriman rose slowly, and faced the man.

"There have been over seventy thousand deaths in this province in the past three weeks, and you have not reported?"

"I have reported," the surgeon quietly pointed out. "There was a general alarm. You are here."

"And your president?" the chief demanded.

"Our president now agrees that the epidemic is beyond our control."

"Eleven weeks!" Merriman ejaculated. "If ever there was a clear case of criminal incompetence, this is it. I shall recommend, if the facts bear me out, that your president be given the limit of the code. Where is he?"

"In conference."

"With whom?"

"I cannot say. Certain infected laborers have just been sterilized."

"'Sterilized!'" the chief muttered. "You callous devils are exactly where you were three hundred or a thousand years ago. What does civilization mean to you?"

"Nothing," the surgeon admitted with unexpected, cynical contempt. "We are older than civilization, as you call it."

"Yet you turned in a world alarm?" Merriman flashed. "Why?"

"To save ourselves."

"I see," Merriman responded "You are one with your president. Take us to him."

"He is resting now. The conference tired him."

"Yes?" said the chief. "Then wake him up."

"The president is completely exhausted. He was not expecting Dr. Castellani till morning," the surgeon evaded.

"Quite so. But we are all here," Merriman pointed out meaningly "What is it that you don't want us to see?"

THE surgeon hesitated, and glanced at Castellani.

"Dr. Castellani," he said, "may wish first to inspect our materials. We planned a flight over the infected fields at eight o'clock tomorrow morning."

"That will be all right," the chief agreed. "In the meantime—"

"Dr. Castellani can study our material," the surgeon hastily interposed.

Merriman stood up. "Look here," he said. "My office makes me your president's world superior. You realize that? Of course. I demand that we be led to him immediately."

"It would be unwise," the surgeon replied bluntly.

The chief glanced at Merriman.

"This man," he said slowly, "seems to know what he is doing. I am convinced that he does. Let us follow his lead."

"But—" Merriman began to object.

"Never mind," the chief cut him off. "We are unwelcome guests. Too early, by several hours. Castellani, you want to see what they have, don't you?"

"Of course," the quick-witted little man acquiesced, seizing the chief's lead immediately. "Many years ago I studied the plum-rot. Perhaps this disease of the rice is like that?"

Watching the surgeon's every move, the chief followed the others into a cool, well lighted laboratory, fully half a mile from the lunch room in the bowels of

the laboratory. The visitors preferring to walk, the head surgeon avoided the swift escalators.

"You are a biologist?" the mosquito-like Castellani queried.

"A pathologist, primarily," the chief surgeon corrected. "Tropical parasites of the bones are my specialty."

"I see. How interesting it must be to pursue those so strange creatures through the suffering marrow!" Castellani enthused politely. "How I envy you. I, for my part, stare all day and all night at the intimate life of the chromosomes, and the domestic indecencies of the genes. In my work there is nothing large—big, grand, as you say."

"Nor in mine," the head surgeon retorted acidly.

"No? But surely that is strange?"

"You shall see for yourself. You were once a plant pathologist?"

"If you will refer to *Who is Who in the World,*" Castellani retorted with dignity, "you will see among my not inconsiderable achievements—I have no inferiority complex, you note—the life histories of the parasitic fungoids responsible for the plum rot. That, you will admit, was no minor laurel in the pathology of plants."

The surgeon did not reply. They had entered a lofty, bare room, a typical research biological laboratory, with its glaring white walls, its neat blue-enamelled filing cabinets, and its battery of microscopes and other optical aids to feeble human vision severely disposed on the obsidian-topped central desks.

"Will you look?" the surgeon invited, motioning Castellani to one of the microscopes.

"With pleasure. But I shall *see,* not *look.*"

Merriman and the chief stood by, anxiously watching their colleague. Castellani was already lost in his intense "seeing." For ten minutes he studied the slide. Almost motionless, but not quite. One thin leg rose and fell, with luxurious slowness like a sucking mosquito's, as the diminutive biologist perched with one knee on the hard oak stool, his whole mind and body concentrated on what he was "seeing."

Castellani, trained since the age of twelve to follow the minutest intricacies of the dance of life, realized instantly what he was seeing. Here at last man had mastered life. Life, in all of its manifestations. To play up and down the scale of organic evolution, so long as one restricted his instrument to one or other of the natural kingdoms—plant or animal—was no great achievement. For nearly a century and a half, geneticists had produced plants or animals almost to order, provided the whim of the purchaser was not too extravagant. But who, so far, had bred a lily from a maggot, or a fly from a toadstool? Not that this had been done, or was even within reach, Castellani knew. No; but the equivalent of it was taking place beneath his very eyes. He understood the fact. How had it been accomplished?

At last he had seen enough.

"What are these cells?" he demanded. "This is the front line, I think, of the war of life."

"Preparations from the rice disease," the head surgeon replied dryly. "But you must see the others."

"From rice?"

"No. From the degenerated tissue of human brains. We have dissected over three hundred cadavers of the rice plague, as we call it."

AGAIN Castellani hovered above a microscope. The head surgeon thoughtfully selected immersions and, stand, as Castellani gazed.
without comment, slid them onto the

Merriman and the chief stood restively by, realizing that here they were merely laymen. What would Castellani tell them of any practical value? The chief began to chafe. He should be running down the criminal disregard of the International Health Code. Why were they standing around watching Castellani make a gnat of himself? "Let's go," he whispered. "I'm going to rout out the president and see what's up. I've changed my mind."

"Wait," Merriman cautioned. "This is—"

Before he could finish, Castellani began speaking. He was not by nature an orator. Yet his remarks now had all the solemnity of an oration. He had seen with his own eyes, he declared, the turning point of all evolution. Henceforth, he asserted, it was not to be man against man, or man against insect, or even man against bacteria, but man against full-

bodied plant.

With his very eyes, he solemnly averred, he had witnessed the transmutations of plant cells into animal cells, and of animal cells into plant cells. How had it been brought about? He did not profess to know.

He commanded the head surgeon to inform him. Had these hellish cells any connection with the rice disease which had caused him to send out a general alarm?

"They are the disease," the surgeon answered quietly. "You are an expert on cells," he continued with a trace of irony; "the foremost mitologist of the world, unless I am mistaken. We thought you might be able to help us."

"How?" the chief interjected.

"By checking the disease."

"And you called us only when you realized that you were beaten?"

The chief surgeon drew himself up rigidly.

"We are not beaten—" he began, when Merriman cut in sharply.

"What's that?" he cried.

The chief held up his hand. "You're right," he exclaimed. "There it is again."

Merriman seized the surgeon by the arm.

"You—! To your chief. Quick!"

"What if I—?"

"That's taken care of. The Observatory knows where we are. The pilot has orders to keep in touch with them. You utter fool! Neither you nor your president can beat the International—"

"You don't know what you are doing," the surgeon panted, as they shoved him into the hallway.

"Nor do you," Castellani rather unexpectedly spoke up. "You so silly idiots! Why didn't you ray us twelve weeks ago? Now it may be too late. Which way?"

The obstinate man refused to budge.

"Which way?" the chief demanded.

"I don't know."

"Leave him," Merriman shouted. "He's double crossing us. Follow the sound. That is a white man's yell. Where is it?"

They listened. Castellani, being the one scientist of the three, forgot his panic and merely listened.

"This way," he said coolly, leading them down an endless corridor.

CHAPTER XIV

A Consultation

WHAT Pobby hadn't done, remained unknown. The impassive president, sitting like the image of death at his ironite desk, motioned to the guards dragging the screaming man to his extinction, and gave a sharp order in his native tongue. The guards held their struggling prisoner back, just as the sound proof doors of the hall of honor closed on the detective and the laborers.

The president's hand, hovering over the desk, descended. With a sigh, he picked up a small, chamois-covered gavel, and tapped a gong at his left, once. A pure white light flooded the room. The president deadened the gong, and paused. Ten seconds passed. He tapped the gong sharply, twice. A dull crimson light flashed up, and vanished. The president pressed the common service button on his desk. To the foreman of the crew of scavengers who responded he gave the necessary order.

"Cremate the bodies."

The foreman withdrew, and the president turned his attention to Yandell.

"We made a mistake," he began, speaking in faultless English, "in stealing the hydrogen-helium plates from the Observatory."

Pobby made no reply. He was thinking desperately how he might reach the radiophone so temptingly near on the president's desk, and yet so infinitely distant. The president's hand still hovered suggestively over the simple appliances on his desk.

"You doubtless think me callous," the president continued evenly. "I assure you I am not. In the past three weeks we have cremated, in this laboratory alone, over eighteen thousand victims of the California disease."

"The California disease?" Pobby echoed, for lack of some more intelligent comment, and to gain time. What followed was like a horrible nightmare to him.

"Have you never heard of it?"

"I confess that I have not," Pobby replied as in a dream.

The president considered. "Nor had

I," he admitted, "when we stole the plates. We seem to have made a mistake."

Pobby's years of oratory came nobly to his assistance. Automatically he delivered himself of what should have been sane advice.

"I am sure," he said, "that where there is a will there is a way. Evil can be undone by good. Let us restore the plates to their lawful owners."

"So you would advise me to give the plates back to the Observatory?"

"It would seem," Pobby declared automatically, "to be the only honorable thing to do."

"Undoubtedly. But what is honor? We have outgrown it."

"Not I," Pobby stoutly asserted with a flash of his old self.

"Perhaps not," the president admitted. "But you are a fool."

"I seem to be," Pobby rather astonishingly agreed, with a terrified glance behind him at the door of death. Was this a reality, or was the execution of those helpless laborers and the detective a ghastly dream?

The president followed his vitcim's gaze. He seemed to be studying the trembling man before him with a certain apprehensiveness.

"You also," he declared, "are probably infected. I have failed in my duty in letting you live. But you may be able to help us."

"I never felt better in my life," Pobby declared. "How can I help you?" If only he could gain time, he might yet save his life.

The president did not deign to reply immediately. In answer to his silent summons, two surgeons appeared. Before the bewildered Pobby knew what was happening, he found himself undergoing a rigorous physical examination, especially of the eyes, tongue and hair. At last the surgeons were satisfied. They reported their findings in their own language, and left the room.

"You are not infected, as far as the surgeons can determine with an anatomical examination."

Pobby gulped. Oh, if only he could keep his head, and quiet the pounding of his heart! He *must* be cool; he *must* find the right thing to say. He almost prayed; his parents had belonged to the older order. But he could not frame his petition. For once in his life he could find no words adequate to his terrified emotions.

ONE thought, beating like a hammer in his brain, gave him the courage not to faint—as his dissolving body almost did. In this moment he touched greatness. His own life, he admitted to himself, was less than nothing. It had been a stupid, conceited, overwhelming failure. In the rash self-assurance of his over-inflated self esteem he had taken upon himself a task beyond his petty powers. To assign it to more competent hands was now impossible. The thought that beat upon his tortured brain was this: "If I must be beaten, my life shall make me great. I will not sell it at a cost less than that of all the lives of all human beings yet unborn. I *must* win, even if no human being ever learns that I have won."

From Parnassus-or-bust-Yandell, the last was the supreme renunciation, and we should honor him for it, in spite of those lounge critics who might maintain that it was merely his natural fear asserting itself in a moment of stress. Dakan for one, Merriman for another, and Hardinge for a third, would credit Yandell with true heroism.

Pobby became aware that the president was still speaking.

" . . . the California disease," was all he heard, as the president concluded. He clutched desperately at the phrase.

"The California disease?" he echoed. "I believe I have never heard of it."

"Then let me describe it to you. Its symptoms, in the historical literature of pre-scientific pathology, are minutely recorded. The distinguishing features is an extremely rapid wastage of nervous and physical energy, with characteristic lesions, somewhat as in the most advanced cases of another forgotten disease, tuberculosis. You have read of that?"

"Of tuberculosis, yes," Pobby admitted with desperate wariness. He could not guess what trap was being set for him.

"Tuberculosis," the president went on, "was a germ disease. Its cause was certain bacteria."

"I remember now," Pobby declared.

"You do? Then perhaps you recall that a very similar disease, in the latter part of the twentieth century, ravaged

North America? They called it the 'California disease,' as its first appearance in the early decades of that century was in California. When it was first detected, it was mistaken for tuberculosis. You are following?''

''Yes.''

''Those early diagnoses were wrong, as was soon learned. The California disease was not caused by bacteria, but by fungi in the blood and tissues of the victims.''

''I see,'' said Pobby, edging toward the radiophone on the president's desk.

''Stand there,'' the president commanded.

Pobby halted. His desperate plan was aborted almost as soon as it was conceived. Two seconds with the dials—sufficient to transmit his own number, I 111, in the A. B. C. code—would have given the International Police the clue which, he realized, they must be seeking the wide world over. The failure of the murdered detective to report by now must have roused the whole International force. Yandell's own number would instantly be reported to London, with the ray intensity of the transmitting station.

A SIMPLE calculation would locate the source of the message. Then failing to hear further from the sender, the police would at once investigate the source. Such was Pobby's entirely accurate theory. He knew now that Merriman had ordered the police to follow him on his travels. All therefore would know every detail of his personality. Such, too seemed to be the president's opinion. Pobby stood where he was.

''The California disease is now merely the name,'' the president resumed, ''given by our biologists to the present epidemic.''

''Why?'' Pobby demanded, trying to feign an interest and keep his eyes off the inviting dials. Should he dash on and risk it, or would it be wiser to wait? He decided to wait.

''The present disease,'' the president continued, ''is due to fungi, as you shall see for yourself in a moment.'' He interrupted himself to speak a short order into the local radiophone, and went on with his explanations. ''The fungi, unlike those of the California disease, do not attack the blood and muscles of the patients. They multiply exclusively in the nervous tissue.''

A white uniformed orderly deposited a microscope on the president's desk, and withdrew. The president invited Pobby to view what was on the slide.

Pobby stepped to the desk. Here was his chance. The president thwarted it.

''I 111?'' he queried with a trace of contempt. ''Stand here. The radiophone will not tempt you.''

He shoved the microscope toward Yandell.

One look was enough. Pobby recoiled in incredulous disgust.

''Where did you get those filthy fungi?'' For the moment his scientific training had overmastered his personal, human fears. The things he had just seen through the microscope were surely no part of a nightmare. They multiplied upon themselves like bacteria in their foul liquor even as he observed their cancerous life in one swift, revolted glance. This was real. It was scientific fact, and no dream.

''Where—'' he repeated.

''From a smear of the nervous tissue taken from the brain cells of that aged laborer. Do you wonder that he died?''

''Why—'' Pobby began, but the president interrupted him.

''You do not? Nor do I. Over seventy thousand have died of this disease, in this province alone, in the past three weeks. You know nothing of this malady?''

''Over seventy thousand have died in this province alone?'' Pobby enquired evenly.

''Eighteen thousand of whom have been cremated in the electric furnaces of this laboratory,'' the president added. ''We dissected only about three hundred. More were unnecessary. The symptoms of all were the same.''

''I see,'' Pobby replied with deadly calm. ''And what did the dissections show?'' He himself felt filthily diseased.

''What you have seen. The nerve tissue is in all cases a mass of fungi. The fungi continue to grow after the death of the patient. You observed that?''

''I did. Like what one reads of cancer in the earlier stages of its final conquest.''

''You will admit then that the disease is serious?''

"Undoubtedly," Pobby acquiesced. He was too outraged to upbraid the callous devil who questioned him.

"It is more serious," the president continued, "when you consider that these fungi are new to science."

"They are quite new? Are you sure?"

"If you wish, I will have my assertion confirmed by our mycologists."

"I will take your word for it."

"You disapprove?"

"Of what?" Pobby demanded with withering sarcasm.

"My disregard of the international health laws. I should have notified the World Health Bureau at once of the epidemic."

"Why didn't you?"

"I found it easier to cremate the bodies. My people are not a unit. The intelligent understand; the unintelligent help the rest to understand by perishing."

"I see. You are exactly as you were three hundred, or even five thousand years ago."

"Exactly. We are an old and despised people in the modern world. We have done with humility."

"But not with the modern world. Notify London headquarters at once of this epidemic."

THE president sat silently, calmly contemplating the reddened, enraged face flaming at his own.

"Do you know," he asked, "why you are not now gas and ashes like that fool set to spy on you by Merriman?"

"Because you think I may be useful to you."

"And you will. What ray intensity causes the degeneration of animal tissue to plant tissue?"

"I don't know."

"Yet you were at the Observatory for twelve years. The plates we stole must be thoroughly familiar to you."

"If they are," Yandell parried, "what of it?"

"This. You will know what ray intensity we must damp in the hydrogen helium transformation. Our physicists have of course thoroughly mastered all the technique indicated on the plates."

"Yes? Then let them stop this epidemic."

"That is your final answer?"

"All that I care to say for the present."

The president sighed. His fingers strayed toward the keyboard on his desk. Yandell watched.

"Before we conclude this," the president resumed, "I should like to remind you that your present whereabouts are unknown to your friends. The detective shadowing you was your last link with London. I have awaited your coming since you left Los Angeles, when I guessed the true purpose of your tour of inspection. The accident of this afternoon has merely hastened a decision which I formed then. You know too much, Mr. Yandell, to be at large. As you refuse to help us in our present crisis, but one course is open to me. For the sake of the future of my people I must insist that you do not communicate with Mr. Merriman. You must not report our recent conversation."

"I shan't," Pobby promised, his eyes on the president's hand.

"You have disappeared," the president reminded him. "The International Secret Service agent is dead. So also are the other witnesses of your walk—the laborers. I can assure Mr. Merriman that you did not call at this laboratory."

Pobby went white. The hovering fingers lightly touched a button, but did not press it.

"Yes?" he encouraged thickly.

"You have vanished," the president pointed out. "The police of this province, at my instigation, will search everywhere for you. I shall report hourly to London their failures to find you. Would it not be wise to tell us what ray intensities to avoid?"

"But I simply don't know!"

"And yet you knew enough about the helium hydrogen plates to risk your life for them?"

"I didn't understand at the time. If I had known—"

"I too. If I had known, I should have waited more mature knowledge from the Observatory. Dakan's last plate, I imagine, will clear up much."

The president interrupted himself to answer the radiophone. The information to which he listened was evidently of grave concern. The harsh lines of his face deepened. Disconcertingly, he glanced up, to find Pobby's eyes hungrily fastened on the dials. The president

followed his glance, and motioned him back, his left hand again hovering suggestively over the call buttons.

"Dakan's last plates," Pobby explained desperately, "couldn't possibly help in a crisis like this. They are to be used in long range work only—possibly fifty or a hundred year shots. Neither he nor anyone else knows what the effect will be of a full concentration of the utmost attainable from the nebular radiations. It is all guesswork and hypothesis so far. They—"

"But they have focussed the cosmic radiations on the biological material?"

"I really don't know. If they have, it can't have been the full intensity. Dakan still had three months to go, when I left, to find the richest region of the sky."

"He has found it."

"How do you know? I have heard nothing of it."

"You guess. The same scource that gave us the plates has kept me informed of the progress of Dakan's work."

"I see."

"And you still refuse?"

"My professional code would forbid me to proceed," Pobby answered stiffly, "even if I knew."

The president was convinced. His hesitating fingers hesitated no longer. Pobby realized that the game was up. Something unsuspected and primitive in him hurled him upon the descending hand, while his own groped for the dials of the radiophone.

CHAPTER XV

Two Victories

HARDINGE'S work proceeded rapidly. The necessary simple calculations from his clue of "4 metres, 10 millimetres, star," were quickly made. On searching for the indispensable "Complete International Guide to Helio Plane Parts," he met his first check. The guide, like the roll of film, had been stolen, or at any rate mislaid. If stolen, its loss proved conclusively that the thief knew exactly what he was about, and what Hardinge most probably would discover if not put out of the way. The loss was annoying, but not serious.

"Ray London," he directed Kate. "International Police headquarters." He opened the chief's code book and began preparing his message.

When the usual identification had passed, Hardinge spelled out, a letter and a figure at a time, his urgent request. London promised to report in ten minutes or less. They interjected a coded question of their own. How did Hardinge happen to be in possession of the private code? His coded reply satisfied them.

What neither the chief nor Hardinge had anticipated, happened. Had they known all the details of the battle above the Amazon jungles, or had they even recalled those familiar to them, they would have acted with greater caution. However, the mischief was now done, irreparably. Every word of Hardinge's conversation with London was avidly decoded by those who had no business doing so the moment it was uttered.

The general alarm had been turned on by London at the request of Zedten national headquarters shortly before the International Secret Service detective shadowing Pobby was painlessly extinguished. Thereafter, a special operator at the switchboard in the central offices of the laboratory, had sat motionless at his desk, his eyes on the call buttons, and a thin steel-bound book open before him. The book was an exact duplicate of that which the chief had given Hardinge.

Although the special operator had no right to the book, he felt justified in making an illegitimate use of it in the present emergency. Like all the leading experts at the laboratory, he was devoted to the welfare of his people, and like the others he realized that this terrible epidemic which was sweeping the province might wreck the daring ambition, on which they had staked the whole future of all their people, before they had well started on their upward path. Had they lied and stolen for years, training their own members of the International Police to iron obedience to a higher authority—that of race—only to be defeated at the outset?

This was the crisis they had not foreseen, this seemingly unconquerable plague. In sheer despair, one of the experts had turned in a call to London for a general alarm. The president had urged against the call. The immediate

problem now facing the staff was to profit by the experience and skill of the world health forces without betraying their own guilt. Therefore it was necessary to overhear order and advice issued from London to both the police and the health forces.

The president of the central laboratories received this message at the most awkward moment for Pobby. It meant, of course, that at least one man at the Observatory was beginning to find the right track. Would it be safe, he debated, to keep Yandell alive until he had divulged all that he knew about the plates, or would it be wiser to destroy him at once? If Yandell were found a prisoner in the laboratory, everything would come out.

For the moment he could think of no plausible lie to explain his unwilling presence. And yet he hesitated to take the extreme course. Rightly or wrongly, he believed that Yandell must know more than he admitted of the nature of the stolen plates and of Dakan's work. Hoping for an inspiration, he temporized. Finding none, he decided to terminate the unprofitable interview in the interest of national safety.

The efficient searchers in London had quickly located the information Hardinge desired. His call bulb glowed. Kate spelled out the reply. As Hardinge decoded it, his face betrayed incredulous astonishment. The reply was the single word "India."

"But that is impossible!" he declared emphatically. "Unless I have lost my mind and my memory, both."

"Doesn't it check?" Kate hazarded.

"Check? It doesn't begin to. Who was at the cosmopolitan table that night when I spilled the soup?"

Kate ran over the names of those she could remember. At the tenth Hardinge stopped her.

"That was the man," he asserted confidently. "I remember the sound he made with perfect distinctness. And it was in the same language, beyond a doubt, as that which the man on the milk-plane tried to imitate."

"Isn't it possible that the searchers in London may have made a mistake?" she suggested.

"Possible, but highly improbably. Their checkers have a regular routine for identifying the nationality—or at least the country of manufacture—of any cruiser or commercial plane from almost any one of its parts. And they report that the plane which made off with our plates must have originated in India. The man who gave himself away at the dinner table was not Indian."

"Mightn't it have been a mere coincidence that he used the same word as the man on the cruiser?"

"It begins to look that way. If so, my hypothesis is blown up — worthless. Well," he sighed, "I suppose there is nothing to be done but to tell Merriman and the Chief at once. Will you ray their plane? The chief said the pilot would stand by till he heard from me."

WHEN Kate heard the pilot's prompt reply from the other side of the globe, she handed the receiver to Hardinge.

"Is Mr. Merriman or the chief there?"

"No sir. They left a short time ago to enter the main laboratory here. Shall I send a man after them? They said they were going to see the president."

"Send someone after them at once, with this message: Please call G 83152 at once."

Hardinge's message probably saved Pobby's life, for the moment at least. The president, in spite of his careworn appearance, was a wiry man, and twice Pobby's strength. He was therefore more than a match for the terrified man who had hurled himself upon the radiophone in a desperate attempt to wrest it from the president and ray his own number, I 111. The president himself was roused to the highest pitch of his fighting capacity. What followed was a primitive, unscientific battle for possession of the transmitter. It was tussle and choke, gag and gouge, until the panting president had knocked out his man, completely. Pobby slumped down half dead on the floor by the president's desk.

The president pressed a button.

"In there," he directed the white-gowned orderlies who answered, nodding toward the lethal chamber. "This man has had a violent attack of insanity."

The orderlies looked to their rubber gloves, and adjusted the sanitary masks covering their faces. Bending down, they lifted the limp form and bore it away to be "sterilized."

Barely had they gone, when the presi-

dent's call bulb glowed. Being alone, he turned on the full speaker. The man at the central switch-board reported London's reply to Hardinge.

"They have identified our cruiser as of Indian origin."

The president almost smiled, a thing he had not done for years.

In a few seconds the call bulb glowed again. The special operator reported Hardinge's conversation with the pilot. So Merriman and the chief were already in the building, were they? The president swiftly removed from his desk the gong, the gavel, and the two bulbs, and locked them in the bottom drawer of his desk. It would not be decorous, he thought cynically, to be discovered by his callers in the rôle of chief executioner. Occidentals are so squeamish about such things.

The three who had faintly heard Pobby's agonized cries, had some difficulty in locating their source. The head surgeon who should have been their guide flatly refused to assist them. Castellani, who had undertaken to lead them, naturally became less sure of himself when the cries ceased, and began trying one door after the other on that endless corridor. Some were locked. The unlocked workrooms were uninhabited at the moment; all the experts were busy elsewhere, fighting the plague — by "sterilization," for the most part.

At last they found the right room. The president was standing by his desk, his face an expressionless mask.

"I have been expecting Dr. Castellani," he greeted them, "but not so soon. You came with him? Will you be seated?"

"No," the chief retorted. "What were those cries we heard?"

"Did you hear cries?"

"We did. They sounded like a white man's."

"WHY not? Are Europeans and American traders and travelers immune to all oriental plagues? Many of these superior men and women have fallen victims in the past eleven weeks, along with hundreds of thousands of our own poor people."

"And you have treated those of our race," the chief demanded, "as if they were your own people?"

"It was a necessary sanitary measure."

"You have kept records of their identity?"

"There has been no time in most of the foreign cases to examine the effects of the victims. Let me explain," he continued coldly. "The onset of the disease is sudden—almost instantaneous. Instant sterilization, as Dr. Castellani remarked, is the only merciful course. Then, immediately, the electric furnace. To keep any papers of the victims, or other marks of identification, would be insanity. We have not yet learned how to prevent the disease or to disinfect against it.

"Of course," he added, "where the victim's name is known, we keep a record. But the seizures are sudden, and likely to occur anywhere at any time. A man may be walking down a country road, in perfect health, apparently, when the plague seizes him without warning. Then, if a detail of the health patrol happens to be in the vicinity, the man is taken to the nearest health office. If no patrol is near, the man dies where he is. His body may not be found for days. These undiscovered sources of new infection are, our surgeons believe, one of our gravest dangers. We ask the assistance of the international health officers in removing this and other dangers."

"Why have you not appealed before?" the chief demanded. "By failing to report you have incurred the full penalty of the world laws."

"Our people," the president retorted, "signed the world agreement over a strong protest, and then only with certain reservations. We are, as you have often reminded us, a backward nation. To expect us to live up to the letter of the world law is not sound statesmanship.

"I see," Merriman replied gravely. "So you have at last taken the law into your own hands?"

"With reservations. It is necessary if we are to survive as a people."

"And yet," the chief pointed out, "you call for help when you get into difficulties with your antiquated policy. Where would you be now without the health service behind you?"

"I did not notify London," the president retorted. "The head surgeon took the responsibility."

"So we have heard," Merriman re-

plied dryly. "And he still seems thoroughly frightened of you. However, whether you had called us or not, we should have come, sooner or later. You can't hide an outbreak like this for long no matter how closely your people stick together. In the end you would have been cleaned up, whether you liked it or not. The world reserves the right to protect itself against your ignorance, just as your people try to coddle their ignorance against the rest of the world. The majority rules, simply because it is stronger than the minority. Shall we get busy?"

"That is why you came, is it not?" the president replied with the faintest suspicion of a sneer.

"Precisely. Castellani, what do you say?"

"I?" the little man shrugged. "I have now seen everything, and I know nothing. This intriguing disease is beyond my so feeble powers. Some new cause is at work."

"Then what do you advise?"

"That we investigate, find that cause. Then we eliminate the cause, and the plague stops, vanishes. Is it not rationally so?"

"And in the meantime?" the chief suggested. "These people will be dying like mildewed flies and infecting the whole world. What are we to do about that?"

"How should I know?" Castellani demanded indifferently. "To quarantine the infected districts, surely that is a work for the health officers and the police. Not for me. I am biologist, not policeman."

"You're right," the chief snapped. "And I shall do that very thing now. Until the plague is stamped flat, or until it dies out with the whole nation, no human being not connected with the international police or health forces enters or leaves this country."

He turned to the president. "You believe in your splendid, ancient, twentieth century isolation. Now the rest of the world will see that you get a drastic dose of it. In half an hour there will be a cordon of air cruisers circling your boundaries that not a fly could get through without their permission."

"The bacteria," the president remarked, as though to himself, "are scarcely so large as flies. They travel, I imagine on the strong currents of the upper levels, as did so many of the spores of efficient world plagues in the past. Your cruisers will be wise to fly at moderate levels. I know."

"We shall attend to that," the chief retorted. He was just about to grasp the transmitter when the bulb of the radiophone glowed. The president snatched the instrument and uttered a sharp command in his own language. The chief eyed him with hostile suspicion. "Something you don't want us to hear, eh?"

THE president did not deign to reply. He was intent on listening to the brief report from the man at the central switchboard, who had just been warned to describe, in his own language, but to mention no proper names in his report. This he did with easy skill. The president learned that a call for Merriman and the chief had just been rayed from the Observatory to the pilot of their plane. He faced the chief.

"A new outbreak," he said quietly, "in the province to the west of this. Had you not better summon the international health forces?"

The chief seized the transmitter and spoke directly with London. Part of what he said was in plain English. A sentence or two, however, were spelled out in code. The president's face remained an impassive blank. His man at the central switchboard, he knew, decoded the chief's orders as fast as he uttered them.

"There," the chief exclaimed with satisfaction, disconnecting, "that's that. The air forces are mobilizing. In two hours you will be most splendidly isolated till you are either all thoroughly sanitated or all thoroughly dead and cremated. The health forces will begin cleaning you up before you know they have arrived. Your own health corps will be under their orders."

"You have no authority—"

"I know that, Mr. President. But, as you have taken the law into your hands for what you consider the good of your obstinate, backward people, the rest of the world is going to seize whatever is left of the law and do with it as the majority sees fit. This is no time for the niceties of international etiquette. We are facing a plain issue of the survival

of the fittest. The world forces are against you. We still know how to do it," he concluded with a grim smile.

The president bowed. "We submit, as we always have done in the past, to the civilized barbarities of superior intelligence. Our health officers will rejoice to cooperate loyally with the world for forces."

"I demand that," the chief retorted, "at its face value. Castellani, are you coming back with us, or will you start your investigation here?"

"If I may have the facilities of your so great and famous central laboratories," he suggested to the president, "I shall prefer to stay here. Otherwise, I shall fly home."

"He stays here, then," the chief decided for the president. "As a reserve officer of the world health service, he will precede you in rank until our forces withdraw from your territory."

The president slightly inclined his head. He knew how to accept the inevitable as well as any man. Merriman and the chief were about to depart, leaving Castellani with the president, when the messenger from their plane hurried in.

"I had difficulty in finding you," he panted. "You are to call G 83152 at once."

"All right. Wait for us." The chief made his connection, and listened intently to the message which Hardinge had carefully prepared, as it came over in rapid code. The only reply the chief made was that as Merriman and he were starting immediately for the Observatory, the discussion of Hardinge's message could wait. With a curt word of farewell, they left Castellani alone with the president and hurried back to the cruiser.

The president waited until they were well gone before excusing himself to Castellani.

"If you will wait here a few minutes," he said, "I will rejoin you presently and show you to your distinguished quarters. There are some routine matters in connection with the laboratory that need my attention."

The first of these "routine matters" was a visit to the man sitting like a stone before the central switchboard. From him the president learned that Hardinge was completely baffled. He inferred readily enough that Hardinge had been relying on two clues to check one another before proceeding to trace down the single clue which he had anticipated but failed to find. The evidence cancelled itself. That London identified the bandit cruiser, from the imprint of the heel, as of Indian origin completely nullified the other, more important clue on which Hardinge had been relying. Again the president congratulated himself on his foresight in attending to details, and hastened out to discharge his second duty. He personally saw that Pobby, now recovered sufficiently to know what was going on, was safely put to bed under the care of two strong male nurses in a room from which he could not escape, where he could make all the noise he pleased.

Feeling like a general who has won two major engagements on the same day the president hurried back to keep his promise to Castellani.

"Would you care to select a private laboratory now, Dr. Castellani?"

"I shall be delighted."

CHAPTER XVI

Framed

HAVING finished with the code book, Hardinge remembered the chief's instructions to destroy it. A few pages at a time he burned the book over the empty waste basket. Then, to make sure that no spy would guess the nature of the book from the crisp, black fragments of burnt paper, he carefully pulverized them. There remained only the indestructible steel cover. How dispose of that? It was even more of a give-away to any intelligent spy than its incinerated contents.

"I'm going to pitch this over the precipice behind the hutch," he announced. "And while I am about it, I may as well throw all this black dust into the wind."

"Hadn't I better come too?" Kate asked.

"If you like. But really there is no reason why you should."

"Well, I'm coming anyway. They said I wasn't to let you out of my sight. Here; I'll dump the ashes."

The gale seized the black dust at the door and whisked it far out over the desert.

"Watch your step," Kate counseled as distinctly as she could above the shrieking wind. "Don't go too near the edge."

They were not alone in the night. Half a dozen solitary figures loomed up on the steep walks, on their way from one workroom or observing station to their next post, their bodies inclined to lean upon the wind. Often in the course of a normal night a man's work would demand a visit to the libraries or the laboratories, or the tool shops, or the developing rooms.

Only the actual observers, like Dakan, were condemned to sit hour after hour in one spot. The rest frequently made excuses of tasks that would give them a brisk, refreshing ten minute walk. Hardinge and Kate therefore saw nothing suspicious in this entirely usual company of rovers.

To dispose of the tell-tale steel binding effectively, Hardinge had selected the darkest spot on the Mountain, a narrow, flat rock ledge behind the hutch. No one would be in the hutch this early in the evening, so he would be unseen as he carefully picked his way through the shadows of the domes and turrets. From the rock ledge a sheer drop of some twenty-five hundred feet fell away to the first slight bulge of the mountain buttress. Anything thrown over the ledge would strike the buttress and leap the remaining ten thousand feet to the desert floor. There was no railing on the ledge, as no trail passed along it, and it was never used.

Hardinge's very caution to avoid being seen almost proved his undoing. Before Kate screamed, Hardings sensed that he was being followed. Some blacker shadow had moved against the shadow of the nearest dome. No shadow could be blacker than another cast by the same dim starlight. It was a human figure moving. At the instant Hardinge was cautiously approaching the edge of the precipice to hurl the steel cover over, Kate's scream, penetrating even the howling gale, was a signal to the creeping shadow. Just as Hardinge raised his arm, the black thing hurled itself upon him like a huge arrow propelled by the wind. Kate's scream and his own startled instincts saved Hardinge; his quick side step was merely a reflex action.

The hurtling wretch missed, reeled on under his own momentum, staggered crazily against the stars for two hideous seconds in a futile struggle to regain his equilibrium against the gale, and plunged from sight. If he gave any cry the wind smothered it on his lips.

Not sure which had perished, Kate rushed forward and dragged Hardinge back from the edge. He was still clutching the steel cover. It bruised her hand, and she knew. Snatching it as if it were a deadly snake, she hurled it after the man who had given his life for it. Her knees gave way, and Hardinge had to assist her into the hutch. He bolted the door and turned on the lights. They stared into one another's white faces, unable to speak.

"Who was it?" he panted, when his chest stopped heaving.

"Oh, I don't know. Thank God it wasn't you."

"Did you see him long enough to note his build?"

"It was like yours. That's why I thought—oh!"

"Here; drink this." He handed her a glass of water.

"I'm all right," she gulped. "We must tell Mr. Dakan at once."

"Yes. We had better go to his office. I wouldn't trust the radiophone on anything after that."

This time they walked in the open. They found Dakan deep in his work. Hearing them enter, he did not look up immediately, but motioned for them to wait a few minutes until he had jotted down the result of his calculation. When he did glance up, and saw whose strained faces were looking down into his, he rose hurriedly.

"What's the matter? Have you—?"

"No," Hardinge replied. "My clues contradict one another. But something has happened that may tell us everything." Into Dakan's shocked ears he poured the brief story of the tragedy. "The man must have been spying on everything we did in my cabin," he concluded. "My guess is that he saw the code book, recognized what it was, and decided that I would be better out of the way. No doubt he has had more than a suspicion of what has passed between Merriman and you since the plates were stolen. We must find out immediately who the man was. I suggest that you

round up the entire staff, from yourself down to the last bedmaker and dishwasher, and take a roll call."

Dakan paced the room, considering.

"THAT would be one way," he said. "But I am not convinced that it is the best."

"Why?" Kate demanded. "There can be only one man missing. There have been no leaves of absence since the order rescinding them was posted."

"I should like to consult the International Chief," Dakan replied slowly, "before taking any step that we may all regret later. This is a matter for expert police handling. Will you ray him, Hardinge?"

"But I have just destroyed the code."

"A plain message would be too dangerous, I suppose. Can't we just ray him to return as soon as possible?"

"He and Merriman are already on the way. Castellani is staying out there. That is what the chief himself rayed just before I destroyed the code."

"Then we shall have to wait," Dakan decided. "They won't be long now. Do you mind if I go on with this? I can finish it very shortly, and it may be a week before I can take it up again with this other thing on my hands."

They nodded, and Dakan resumed his work. Although they had not long to wait, the minutes dragged by like eternities. At last the call bulb glowed on Dakan's desk, and they heard Merriman speaking.

"We shall be at the Observatory in four minutes. Are you in your office?"

"Yes. Hardinge and Miss Douglas are with me."

When Merriman and the chief arrived, Hardinge briefly recapitulated his report. The chief's decision was instantly made.

"We must find out at once who this man was, but we must do it in such a way as to rouse no suspicion. You have some means, Dakan, of getting them all together on short notice?"

"Yes. A general call from the main office will bring them all out."

"Then please see that it is done at once. Where do they meet?"

"In the dining hall. To make sure that we get them all, I shall send round half a dozen men to check. Then we can wait for the half dozen."

"Very well. Leave the rest to me."

Within twenty minutes the whole wondering staff, down to the humblest dishwasher, was assembled in the dining hall.

"I have something very important to say to you all," the chief began. "First, as many of you doubtless don't know who I am, let me introduce myself. I hold the office of Chief of the International Police, with headquarters in London. A matter of the gravest concern to all of us has brought me to the Observatory." He interrupted himself to make a side remark to Dakan, so that only he and Kate, sitting beside him, heard. "You are checking the roll?"

Dakan nodded. "Miss Douglas is making an independent count. We shall be through in a minute."

"The director has just told me," the chief resumed, "that everyone is present. So I shall not need to repeat what I have to say. It is simply this. A world alarm, first to the biological division of the public service, second to the general health and police divisions, has gone out from London. A plague of unknown origin is raging in Zedten.

"The affected country has been isolated by the world police. The entire mobile forces of the international health service are already engaged in the field. Under these conditions, you will agree that every man and woman in the public service, of which you are members, must work without relief until the cause of this plague is discovered and the infected country thoroughly sanitated.

"That is all for the present. The director will doubtless reorganize the work of the Observatory in keeping with the emergency, as scientific reports come in from the biological experts now in the field."

THE staff filed out with sober faces. They all knew that world alarms are not sent out for mere trifles. The more nervous began whispering that the chief had not told them everything. It was obvious to them that their absent member had been stricken by the plague, and that the chief had suppressed the truth to spare their feelings. The others tried to laugh away the fears of their timid colleagues, and some, with perfect honesty, declared that death was death and that they would as soon die of the mys-

terious plague as any other way. But all surreptitiously scanned the company, looking for some familiar face that they dreaded to find missing.

The chief, Merriman, Kate, Dakan and Hardinge lingered behind.

"We may as well stay here till the next move," the chief suggested. "It is really more private than one of the cabins or offices. Here we can see everything out in the open." He turned to Hardinge. "You said over the radiophone that your clues had cancelled one another. Are you still of that opinion?"

"Almost."

"But surely the death of this man fixes the nationality of the spies here who stole the plates?" the chief insisted.

"It would seem to," Hardinge admitted. "And yet the man may have been a mere hired underling of another nation."

"I disagree—in principle, whatever the facts may ultimately prove. Hired underlings who would commit murder don't get jobs in places like this Observatory. The force is too carefully picked. That man tried to kill you. We shall find, I believe, that he was no mere gangster of the prehistoric breed, but a highly trained agent of his country."

"But what of the cruiser? The London experts positively identify it as of Indian origin. The heel, from my measurements of its impression in the desert, fixes it as a standard cruiser manufactured in Benares."

"Most fortunately for us. That alone is sufficient to convict one member of the Observatory staff. Dakan, who are the Indians on the Mountain?"

"Outside of two Hindoo cooks' helpers, Bhattacharyya is the only one who has worked here for over a year."

"Then Bhattacharyya is our man," the chief declared. "He had the passkey to the lockers. He also had the brains. His highly trained confederates in the kitchens did the packing and the rest."

"But—" Hardinge protested.

"Never mind," the chief retorted. "I'm going to frame him in the good old American way."

"You can't do a thing like that!" Kate flashed.

"I can and I shall," the chief asserted. "And what is more, I shall do it with Bhattacharyya's full consent and cooperation. That man, if I am any judge of human nature, loves his backward people. To help them, and keep the plaque from wiping them out, as it well may do if the health forces are not pretty sharp on this job, Bhattacharyya won't mind a little personal unpleasantness."

Hardinge smiled, and held out his hand.

"Sorry," he said, "that I was so thickheaded. I see your strategy."

"I don't," Merriman asserted bluntly, and Dakan echoed him.

"It may be a long shot," the chief admitted, "but anything is better than nothing, and I believe this will work. The moment Bhattacharyya is convicted and sentenced, the guilty man will develop a sudden sickness—by eating soap or something equally disagreeable and harmless. This crook is a highly important man to our enemies, for he knows a great deal about the affairs of your Observatory. And naturally his friends will wish to have him safely back home before he is found out.

"I'll wager that even now they are scheming to rescue him from here. When he goes to the hospital he escapes—not in any spectacular way, I anticipate, but by simply walking out of the building and taking a high-level express at the nearest landing stage. The crew will be friends of his. We shan't stop him. Instead we shall follow him all along the line, by letting him dodge through conveniently vacant zones, until he lands in his home town. And there we shall find the plates.

"Then," the chief concluded with a smile, "another idiot will learn that the world police are stupid only when it suits them to appear so. Dakan, the first move is up to you. Have those two Hindoo cooks' helpers taken to the hospital. Make a fuss about it, so that the whole Mountain shall hear of it."

"The whole world will know about it inside of ten minutes," Dakan assured him. "Those boys can talk. I shall put their arrest up to the aviator."

AT first the drowsy airman did not quite understand what he was to do. When he did, he threatened to resign on the spot. He wasn't going to expose himself to the plague. Dakan re-

assured him. The cook boys, he explained, had looked pale and overtired in the dining room while the chief was speaking. They couldn't afford to have anyone not in perfect health depressing the general morale by moaning about in a trance.

Convinced finally that he wasn't in imminent danger of the plague, the aviator consented. Under the pretext of taking those guileless Hindoos for a joyride over the desert—a thing strictly against the rules, although they were stupidly unaware of the fact—he got them aboard. A short time later they were amazed to find themselves being put to bed in a first class hospital.

When Dakan returned from seeing the Hindoos off, he found Merriman and the chief alone waiting for him. A small delegation, they had decided, would be better than a large one for their delicate mission. They started for Bhattacharyya's cabin.

While the momentous interview was in progress, Kate and Hardinge tried at first to settle down to serious work, but finally gave up the attempt.

"Let's go up to the hutch and have a cup of coffee," Hardinge suggested. "I'll leave a call for Dakan, telling him where we are."

"All right," she agreed, "if you don't walk too near the edge this time."

"Never again," he shuddered. "I'll have a phobia against high places the rest of my life. When I retire, I'm going to be a beach comber by the Dead Sea. I can't fall very far then."

Entering the hutch, they found it jammed with a debating crowd of excited men and women. Hardinge and Kate were not the only ones who found it difficult to concentrate on their work. The sole subject being discussed was this mysterious plague that had come upon the world as suddenly as if it had risen from its grave in the middle ages. Such things had no business upsetting the modern world. What was science good for, if it couldn't prevent such a disgrace?

Mamoulian, brooding as usual in sombre silence, suddenly delivered himself of a loud speech. It was the first they had ever heard him make.

"Science is good for nothing!" he almost shouted. "We still have misery in the world. We still—"

CHAPTER XVII

A Sane Hypothesis

GANESH BHATTACHARYYA was a man of dignity and few words. When he realized that Merriman, Dakan and the International Chief were calling on him, he gravely set out chairs and silently produced cigarettes and cigars. He himself did not smoke. To smooth over the awkward pause, his guests lit up. Merriman opened the conversation.

"We have called," he began, "on very serious business, which may affect you unpleasantly, but only for a time."

"Is it about this plague in Zedten?"

"Yes."

"But I am well."

"We are not suggesting that you are a subject for the hospital," the chief broke in. "Go ahead, Merriman."

"It seems to have been established," Merriman resumed, "that the germs of such mysterious epidemics are carried in the upper air streams, and may not settle to infect another population for years. That, at least, is the contention of the health officers who have looked up the records of past disastrous outbursts. Your own country may be the next to suffer."

"My poor people! What have they done to deserve this?"

"Nothing," Merriman replied quietly. "If they and some of the others in the Eastern Hemisphere had done something—anything—to help modern progress, we might now be a century beyond this sort of thing, instead of in the middle of it."

Bhattacharyya's eyes flashed. "Modern progress," he echoed with infinite scorn. "What has it done for my people?"

"I suspected you of feeling that way about it one evening several weeks ago, when I noticed you watching an everyday scene on the Ganges over the telephotoscope. Your soul was out there, with your people, in their unenlightened backwardness, although your body was here in the very temple of science and the modern age. Why do you not return to India?

"Because I love it too much."

"So much in fact that you stay away

from it for at least six months out of every year?"

"In order that I may help my people. Without some knowledge of the modern world they must perish."

"And that quickly. The life here is distasteful to you?"

"Yes. Every hour of it is a defilement."

"Your love for your people must be as great as I have always believed it to be. What would you do to help them? To save them from this plague, let us say?"

"Whatever was asked of me."

"Even to going to prison?" the chief demanded.

"Even to death."

"But the total loss of your honor for an unjust accusation?" the chief persisted. "To a man of your temperament, I imagine such a degradation would mean more than the loss of your life. Would you accept that to keep this plague from your people?"

"Why not?"

"I am making you a definite offer," the chief continued. "If you will consent to temporary disgrace of the blackest kind for a short time—say not to exceed one year—we can greatly help not only your people, but the whole world. Would you accept such a bargain?"

"Yes, if you can show me that you are not deceived."

"Very well," the chief assented. "We have your word, and you have ours. Dakan, you tell him as shortly as you can about the theft of those plates, and why we suspect that their recovery is important."

Dakan clearly explained the whole situation. Bhattacharyya received the facts in inscrutable silence. His eyes never left the narrator's face. When Dakan had finished, the chief took up the story, outlining the frameup which he had planned.

"From Hardinge's work it is certain that the bandit cruiser was of Indian origin. The two Hindo helpers in the kitchen have already been tranferred on a pretext to a hospital, in order that the suspicions of the curious may not be roused should they note the absence of the man who fell over the cliff. I told them in the dining room, you remember, that one man with a minor illness had been taken to a hospital.

"That was merely to cover the man who accidentally lost his own life while trying to put Hardinge out of the way. He was not, of course, one of your people. From such material, a very handsome frame of circumstantial evidence can be constructed. You, as the only Indian of high education on the Mountain, are the brain behind the theft. We need not refer to the man who was killed. I ask you to submit to arrest and to stand the conviction and life sentence which the International Court will impose. The sentence, of course, will be revoked as soon as the plates are recovered. I need scarcely add that you will be honored the world over for your part in the recovery."

Bhattacharyya stood up.

"Take me," he said. "I confess. The evidence against me is complete, or almost so."

"We knew you would consent," the chief exclaimed.

"I am not consenting. You have caught me."

"What on earth do you mean?" Merriman demanded.

"I am guilty. I stole the plates."

"But the man who fell over the cliff," Dakan protested, "was no native of your country. Why did he attack Hardinge?"

"How should I know? Some private grudge, perhaps; a dark and windy night; a man who unwittingly offends, not because he is unkind, but because he thinks more of himself and of his own race than of others and what he believes to be the inferior races. You have read histories of the colonization of Asia by occidentals? Yes. Not so many centuries ago there were many Hardinges in the orient. India had her quota."

THEY stared at him incredulously.

"I have heard of speedy third degrees," the chief remarked, "but this one beats the record. Now, Bhattacharyya, if you did steal the plates, who helped you?"

"Need I betray them? You may easily question them as you have questioned me."

"Those two boys I have just had sent to the hospital?"

Bhattacharyya almost broke down. "Believe me," he begged, "they are in-

nocent. I told them the packages of plates were mineral specimens from the Mountain I was sending to a scientific friend in India. As it is against the rules to send uninspected packages out from the Observatory, I bribed them to smuggle them into the milk cases. A friend in the dairy, I said, would receive them and send them safely to India."

"This friend in the dairy is a native of India?" the chief asked.

"Yes, but he has returned to India now, where it is not a menial task to minister to the sacred cows."

"All right," the chief went on, "we accept your friend for what he is worth. If he is still at large, we shall catch him, and set him at something harder than grooming cows or in packing their holy milk bottles. What we really want to know is: Where are the plates now?"

"I do not know."

"Or won't tell?"

"I have not known since they left this Observatory. I simply carried out the bidding of men who are wiser than I am."

"Your Brahmin friends?" Merriman suggested.

"Perhaps. I do not know into whose hands they were finally delivered."

"But you must know," the chief insisted, "who acted as go-between for you and them. I suppose there is no use asking for their names?"

"None."

"If the old conservatives in India got hold of them," Merriman observed pessimistically, "those plates were destroyed weeks ago. I know their philosophy of life."

"Well," the chief sighed, "we seem to be back where we started, or even farther back. There is one thing I can do—sweat those two cooks' helpers in the hospital, although it will probably be useless. If they are innocent, they can't prove it; if they are guilty, I can't prove it. In either case they will be so upset that whatever they say will be worthless as evidence. We really should sleep on this, but there isn't time. I'm going to get Hardinge's opinion before I act decisively. Bhattacharyya, you have asked to be arrested. Do not leave this cabin until you hear further from me."

"Mr. Merriman may stay if he wishes," Bhattacharyya suggested. "He understands the lot of my people."

"Perhaps I had better," Merriman agreed. "When you reach a decision, please let us know at once."

"I shall. Come on, Dakan."

WITHIN twenty-four hours, Bhattacharyya was tried, convicted and sentenced to solitary confinement for life by the world court in London. All attempts to shake his confession, and wring from him the names of the higher conspirators, failed. Sticking obstinately to his first assertion, he declared simply that he did not know and had never even sought to inquire.

The two Hindoo cooks' helpers in the Los Angeles hospital were grilled without result. As the chief had anticipated, they were either innocent, as Bhattacharyya declared, or astute enough to masquerade as ignorant men who, at the worst, could only have been the unwitting tools of a superior intelligence. They acknowledged immediately, when questioned, that they had accepted numerous small gifts of money and trifling luxuries from their eminent fellow countryman, but had never supposed these to be anything but the kindly expression of Bhattacharyya's sympathy for a pair of fellow exiles. The police reluctantly concluded that if the boys were not the plain fools they seemed to be, their defense was impenetrable.

The details of Bhattacharyya's trial and sentence were broadcasted over the world by the International Police the moment the confessed criminal began serving his sentence. The impartial judges added an appeal to all good world citizens to keep a sharp lookout for any evidence of the missing plates, and to report such evidence at once to headquarters in London. They also stated that the Indian Government need make no appeal in Bhattacharyya's case, as the matter was beyond their jurisdiction.

Although the Indian Government, with some half a dozen others of the Eastern Hemisphere, had never ratified the World Pact of Public Safety, they were subject to the will of the world majority, on biologic grounds if no other. Those who could not keep step with modern progress and protect themselves, must be protected by the majority for the good, not of themselves, but

of the progressive majority.

Bhattacharyya accepted his sentence with resignation, almost with quiet joy. Solitary brooding for the remainder of his natural life would bring him many steps nearer the Nirvana of his goal, where there is neither thought nor action, progress not retrogression, space nor time, only an absolute nothing.

Merriman had returned to London to coordinate the world forces. The reports from the biologists in the field were sufficiently alarming. The only remedy they could propose at present was a wholesale destruction of the rice crop. This was ordered and for a week squadrons of armored cruisers flew low over the rice fields, drenching and withering the rice crops with blasts of flaming oil and gas.

For some days there was a temporary lull in the plague. Then it slowly rose again to its former peak. Castellani, reporting daily from his laboratory at Zedten headquarters, adhered to his first assertion that the cause of the plague must be discovered before they could hope to conquer it. So far he had not found the cause. It simply existed as an unexplained fact, new to science, killing its thousands daily. He was beginning to form a theory of the origin of the destructive fungoid bodies responsible for the disease, but it was only a beginning.

FOR the present he advised a wider destruction of all growing things. They must isolate the infected zone by a broad band of utterly bare, sterile soil. This suggestion was adopted, and the armored air forces again sailed forth with gas and flame. The inhabitants of the isolated zone were fed by supplies dropped from the air. Within three days the united mercantile air forces of the world were commandeered and pressed into the service.

It was during this critical period that the first disaster overtook the armored air forces and caused the expert fighters to doubt the strategy of their whole desperate defense. Leaving no guess untried, the biologists had delved into the almost forgotten history of world epidemics, and had come upon the curious fact that in those ancient conflagrations of disease, the higher air lanes were discovered to be teeming with pathogenic bacteria. The South American youth's disquieting knowledge of historical curiosities was put to a thorough test. The upper air lanes were found to be practically sterile so far as harmful bacteria were concerned.

The historical diseases had simply vanished from the air under the constant vigilance of modern sanitation on the earth's surface, and no new germ was discovered to which the present plague might be traced. This, the biologists declared, was undoubtedly the reason for the immunity from plague of the men in the cruisers. Without the slightest warning, their easy confidence received a nasty jar.

In the new, wider destruction of growing things recommended by Castellani, the cruisers flew but a few feet above the ground. Late one night, the leading cruiser of a squadron of five hundred, sweeping a broad belt with gas and flame, was observed to stagger in the moonlight, shoot vertically up to a considerable height, and then suddenly crash. There could be but one explanation: the pilot had lost control. The following squadron had risen sharply, at the first sign of danger, to avoid a possible collision. A detail of the health patrol was summoned to investigate, while the squadron continued on its flight of destruction.

Almost before they examined the bodies, the health patrol guessed what they should find. The pilot had died of the plague. The sudden upward flight of the wrecked cruiser was his last sane gesture as the intolerable itching inside his skull drove him mad. Overcome by the full onslaught of the disease before he could turn over the switches to an assistant, he had wrecked the cruiser in his insanity.

Thereafter the gas and flame squadrons were ordered to fly higher, until the biological forces could determine whether the air close to the ground carried the fatal spores. They found nothing; the air was sterile. The squadrons returned to the lower levels. Again there was an unaccountable wreck, and the cruisers retired permanently to a safe distance above the ground.

The biologists confessed themselves baffled, and advised that some other branch of the public service work over the facts of the wrecks. Merriman sug-

gested the problem to the Observatory; Dakan proposed it to his staff, and Hardinge volunteered to attempt a solution. None of the others expressed any confidence in their ability to help.

Hardinge, however, was not to have the honor of clearing up the mystery. That fell to Chou, who modestly explained his success by the inordinate quantities of food he consumed to avoid Dakan's displeasure. The suggested solution was far from complete, but it was a first reasonable step, and it started the investigators on a new and more promising trail.

Half an hour after Hardinge had taken up the problem, Chou called on Dakan with his own suggestion. Since the air was sterile from ground to "ceiling," he pointed out, the origin of the plague must be in the soil itself. Obvious when seen, but not so easy to see in the first place.

And equally obvious was his second conclusion. Whatever was causing the plague could not be constant in its activity. Otherwise the biological troops who had thoroughly explored the lower air in the neighborhoods of the wrecks for wide distances, must have suffered the same infections as had the dead pilots and members of their crews.

It followed, Chou argued, that the cause of infection was either sporadic, of short life, or intermittent. On checking against the voluminous field reports of the progress of the plague sent in by the biologists at the front, it was found that neither of Chou's hypotheses was contradicted by the facts. As a reward, at Chou's own request, Dakan permitted him to cut down his daily consumption of food by twenty per cent.

One dull morning in this anxious month, when the biologists had confessed their defeat and the other branches of the world public service were desperately trying to follow up Chou's hypothesis, Merriman came late to work at his London office. He had hardly slept all night, and he dreaded the day before him. For some minutes he sat idly at his desk, staring distastefully at the stack of papers piled neatly up for his perusal.

WAS there nothing he could read first, as a sort of mental cocktail, to stimulate his mind for the flat drudgery ahead of him? His hand strayed absently to the pigeon holes of his desk, where he habitually filed a few pocket editions of his favourite books and precious letters from friends that were worth keeping. A neat roll caught his eye.

"Just the thing," he exclaimed, reaching for the only one of Pobby's stupendous reports which he had ever even one-tenth read. It was an excerpt from the classic containing Pobby's indignant account of his exciting adventure with the toothless old Jezebel by that irrigation ditch somewhere in Central Africa.

No sooner had Merriman started to read, than he dropped the manuscript as if it had stung him. He rang for his secretary.

"Please bring me Mr. Yandell's last report."

Presently the secretary returned to say that no report had been received for nearly five weeks.

"And I wasn't informed?" Merriman demanded.

"I am very sorry, Mr. Merriman," the secretary apologized, "but we have all been so rushed of late that we didn't notice that Mr. Yandell's reports had stopped coming. As you never acknowledged them, he has probably tired of writing them."

Merriman went white. "Find out at once where the last report was mailed, and when."

The information, obtained in a few minutes, gave Merriman a further qualm. When he sent in his last report, Pobby was dangerously near the plague region.

His next stop, on his tour of inspection, might well have been in the region itself.

The obvious conclusion was so shocking to Merriman that he suddenly felt faint. The president of the laboratory at Zedten headquarters had calmly told them that many occidentals—tourists or traders—had perished in the first outburst of the plague, and had declared that, for sufficient reasons, their bodies were cremated as quickly as possible without any attempt at identification. Had Yandell been one of these unfortunates?

"Get into touch with the Chief of Police at once. We must trace Yandell immediately."

CHAPTER XVIII
Their Pets

CASTELLANI had been getting on fairly well with the president of the central laboratories of Zedten. Knowing what was best for himself, the astute president had placed all the superb facilities of the laboratories at the disposal of his distinguished, if forced, guest. He seemed to go out of his way to anticipate every whim of the wasp-like little biologist and make his work pleasant.

Failing to solve the innumerable puzzles presented by those intriguing fungoid bodies which fascinated him, Castellani had reluctantly directed his penetrating intelligence to a more elementary, matter of fact, attack on the origin of the plague. Although he was no detective, and the affairs of human beings interested him less than the behaviour of their cells, he was by no means obtuse when it came to sizing up his fellow men.

The president he secretly detested. There was something too accommodating and a little too smooth about this wily oriental to be quite genuine. Hiding his intense dislike of the man, Castellani decided to find out, as unobtrusively as possible, what it was that the president was concealing so carefully. From quiet observation of the president's demeanor toward his subordinates, Castellani concluded that although he might be smooth enough, he was anything but kind, and was in fact little better than a ruthless, unfeeling tyrant and a slave to some morbid ambition.

A similar judgment applied in part to every man and woman of the laboratory staff with whom he had any dealings—social or scientific. They one and all were nursing some secret ambition which gnawed at their vitals and gave them no peace. All were touchy, hypersensitive, and acutely conscious of their race which, curiously enough, the majority tried to deny by small hints, casually thrown out, and they were partly occidental by heredity and wholly occidental by training and sympathies.

Never had he worked in such an atmosphere of intense, nervous striving to succeed and, what was less comfortable, stealthy jealousy. Of whom were they jealous? Certainly not of one another, or even of their iron-faced, steel-willed president, for they worked incessantly as a single well drilled unit. Their subordination and rigid discipline recalled that of a perfect army under the generalship of an inflexible man possessing great military genius and the determination to win in spite of overwhelming odds against him.

As a preliminary to his matter-of-fact investigation, he put away his microscope, locked up his slides, and rayed the headquarters of the World Geographical Survey to send him ten complete sets of their largest scale maps, in sections, if necessary, of the industrial provinces of Zedten. The maps, nearly a ton of them, were sent at once from London by high lane express. It was necessary for the geographers to obtain a passport for their express through the police cordon about the plague stricken country. They applied directly to the International Chief, who at once gave the requisite orders.

"Hold your express a minute," he added on an afterthought. "I think I shall take a look out there myself."

All this of course was duly considered by the president of the central laboratories. For twenty-four hours a day the signal buttons of the main switchboard were watched, and every word, code or plain speech, that passed between branches of the international service was minutely recorded and carefully studied. Of the present messages the president and his expert collaborators could make but little.

"Probably Castellani wishes to prepare an official report," the experts decided, which, in one sense, was precisely what Castellani planned. The alleged subtlety of the orientals, however, was slightly at fault in this apparently trivial episode. Doubtless Bhattacharyya's broadcasted confession and conviction had somewhat dulled the edge of their habitual caution. But this is no excuse for their failure to connect Castellani's request for the maps with Chou's common sense suggestion, which also had become world property ten minutes after he had made it to Dakan.

CASTELLANI was pleased but surprised to see the chief. The latter denied that he had come for any par-

ticular purpose, which was true. Nevertheless, a vague sense of uneasiness about the whole situation had caused him to drop in on the offchance of gingering up some division of the police forces.

"May I sit here and watch you work?" he enquired of Castellani. "The flight rather tired me—it always does, in those high lane expresses. What they gain in time they lose in comfort. I shan't disturb you."

"Instead you shall help me," Castellani declared. "Then I shall have my report ready by dawn tomorrow. I shall go to bed, you shall go to the Observatory with my report. Maybe some of those so eminent mathematicians at that great institution of research will then prove that they are not altogether without value in an emergency."

"Help you?" the chief echoed in dismay. "How the devil can *I* help you? I know nothing of biology."

"As I call off my round numbers, you cut out a square. One hundred—you give me a square one millimetre on each side; one thousand, a square ten millimetres on each side. Then you paste the uncolored side of the square, and hand it to me, quickly. I know my maps will thus lie," he apologized, "but you cannot take square roots in your head. Nor can I. My lying maps will be that much the more energetic. They will leap to the eye. Use only one color of paper till I tell you to change. Let us start with scarlet, my favourite."

For twenty hours they toiled, working ever faster and more expertly as the minutes swiftly passed. From the long columns of figures on the clearly typed sheets in a pile by his left hand, Castellani read off numbers, smoothing each to the nearest hundred, while the chief clipped the corresponding squares, pasted them, and handed them to the biologist, who carefully stuck them onto the large scale map before him.

They rested only between colors, when a completed map, thickly dotted with neat squares all of one hue, was laid aside, and a fresh one laid in its place. By daybreak they had ten such maps, each of which gave at a glance the number and distribution of deaths from the plague in ten equally spaced intervals of time, beginning with the date of the world alarm, when the biological forces took charge, and ending with the day Castellani ordered the maps. They therefore had a complete, graphic record of the entire course of the plague in the industrial provinces of Zedten during the time the international forces had been in control.

"Now you will take these to the Observatory," Castellani remarked, stacking up the last of the sheets. "I go to bed. Good morning." And with a quick, energetic bow, he abandoned the hapless chief to supervise the details of packing the fruits of their twenty hours' hard labor. The chief did not tarry for so much as a cup of coffee.

Arrived at the Observatory, he ordered two of the crew of the express to carry the precious maps to the director's office, and followed at their heels to see that they dropped none.

"A history of the plague since we isolated Zedten," he explained to Dakan.

"This is invaluable. Why didn't someone think of doing this before?"

"Is it good? Castellani sends it to you with his compliments. He says some of your mathematicians may be able to make something of this."

"It scarcely needs a mathematician. Don't you see? These squares tell us where the infection starts, how long it persists, and where it goes next. You can fairly see it crawl over the country. Now we shall find the dangerous foci. Perhaps, after all, I had better turn an expert onto these. It will be quickest." He called Hardinge. "Bring Miss Powers over here, will you? The chief has brought her an easy Chinese puzzle to amuse her for a minute or two."

Hardinge arrived, almost on the run, with his junior mathematical assistant. Miss Powers was the charming young woman who had routed Merriman when he tried to stump her with an infantile problem in compound interest. Dakan briefly explained what was required. He also mentioned that the square roots of the sides of the colored areas were the scale. From the maps they wished to know where the plague originated, its rate and manner of spreading, and how long it could be expected to infect a given locality after it had first appeared there. Miss Powers glanced rather disdainfully at the first map of the series, visually estimated the number in the stack, and turned to Dakan.

"Where is your stenographer?"

"Over there, in the corner."

"Will you please adjust it to record rapid dictation?"

Dakan set the machine, and turned the receiver toward the somewhat bored Miss Powers.

"Would someone mind turning the sheets for me?" she requested. "I'll raise my hand when I wish a new sheet."

"I'll do it," the chief volunteered.

AS fast as she could speak, Miss Powers began reeling off strings of figures at the stenographer, while the chief exhibited the maps. Some of them she barely glanced at, and signalled for the next. Those over which she lingered more than five seconds were the ones with the fewest colored squares—which might have puzzled the uninitiated. Where the squares were numerous, the whole beautiful story was spelled out in full to her naturally expert eyes; where but a few squares spotted the map, she had to estimate accurately not only missing letters and words of the mathematical law behind the data, but whole sentences and paragraphs. When the last sheet was mentally analysed, she raised her eyebrows, as if astonished at the ungallantness of the men about her.

Dakan himself obliged her. From the unerring machine he took the faultlessly typed roll of everything Miss Powers had said, including her request that it be fetched for her.

"Unroll it on the long bench by the window, please."

There were nearly twenty feet of it—all columns of numbers. Miss Powers walked slowly down the length of the bench, her eyes roving up and down the columns. Coming to the end, she confessed that it was a trifle worse than she had anticipated.

"It is a rather complicated function of eighteen variables," she said. "I'll have to think a minute."

And for a full minute she thought, an excess she probably had not indulged for a month. The stuff Hardinge was always giving her never bothered her beautiful head. It merely bored her, except on special occasions when she came upon something new and wonderful.

When the minute was up, she requested "one of you" to put a new roll in the machine and adjust it for rapid dictation. Dakan obliging her, she instantly reeled off her report. This time it was in plain English, except for the plentiful sprinkling of names of manufacturing towns in Zedten. "Is that all?" she concluded, raising her eyebrows.

"Thank you, Miss Powers," Dakan replied, stopping the stenographer, "that is all. You may go baek to whatever you were doing."

She left, skipping. The three men sat staring at one another.

"What does it mean?" the chief asked.

"Simply this," Hardinge replied. "The plague originated simultaneously in all the cities and towns with research laboratories, private, national, or international, in all the eighteen manufacturing provinces of Zedten. That, I should say, is a most remarkable coincidence of the purely human kind. And it also means this: the infection spread sporadically, like spots of mold on a cheese, from those research laboratories.

"At first the laboratories were the foci of infection; now there are wide rings of uninfected soil surrounding all of the laboratories. The infectious spots are travelling out, at a constant rate, like ripples on a pool, from the initial infections. But it is not like ripples on water in this respect: the advancing waves are merely more or less ring-shaped armies of spots of progressive infection. And, most significant of all, each of those spots remains active for approximately the same length of time, depending upon the amount, but not the quality, of the food that is keeping the infection alive.

"Again a most remarkable coincidence. But in this one there is nothing human. It is entirely natural. I believe we've got it at last. The natural coincidence should show us how to fight the plague; the human one, which we can deal with later, will tell us exactly how the plague originated."

"That sounds like a reasonable interpretation of Miss Powers' conclusions," the chief remarked. "What's the next move?"

"I should say," Hardinge replied slowly, "that we have almost enough evidence now to make a decisive arrest. But, on the whole, I believe we shall do better by waiting till we are one hundred percent sure of ourselves. What

do you say, Dakan?"

"Check. We can't afford to blunder now. In my opinion, the problem should be turned over to the physicists and the experts on metals. That is what I advise."

"Will you see to it?" the chief asked, "and report to me? I must get back to London."

"Certainly. There should be something to report within twenty-four hours."

THE program which the three had agreed upon was already being carried out. The president of the laboratories at Zedten headquarters had reached similar conclusions nearly four weeks before Castellani thought of making his maps, but for a more obvious reason than that which moved Castellani. Thus far nothing had come of the president's inspiration.

Having enjoyed a refreshing sleep for a full eight hours after the chief's departure, Castellani rose and devoured an unseemly combination of breakfast and lunch. His physician had ordered him never to miss a meal, so he frequently crammed two or three into one.

Work did not attract him for the moment. He strolled out to take a walk in the private high walled park where the laboratory staff indulged in what little exercise they grudgingly admitted was necessary for efficient work.

The park was probably unique in the world. A layman would have noticed only the well kept lawns, the brilliant flower beds, and the clump of carefully tended trees, and he most likely would have accepted the whole as a particularly attractive pleasure ground. It was nothing of the sort. Those intensely earnest orientals slaving in the laboratories had neither time nor use for pleasure. Every flower and every tree in that park was a highly bred aristocrat of its own species.

An expert viewing the park would have at once detected the slight, significant variations from standard types of all the growing things in that park. It was nothing less than an experimental farm and garden on a large scale. The plants and trees had been painstakingly bred—created, almost—under complicated laboratory conditions, and had been set out in the open when mature enough to show what they could do under natural conditions. Were the valuable mutations induced by the penetrating rays generated in the laboratories permanent? Would the new species created in the laboratories revert after several generations in the open to types of their worthless ancestors? Theory said not, but theory had so often been contradicted by nature. Only time and patient observation could decide. Those orientals were infinitely patient.

Castellani wandered into a distant part of the park he had not hitherto explored. The shrill cries of tropical birds in the distance had attracted him. He loved vivid color, and looked forward to a treat of great flaming macaws. The aviary, tastefully planted with trees and shrubs, came up to his expectations, in fact surpassed them. These glorious birds were no gaudy plebians from the tropical forests and jungles of the orient. Like the shrubs and the trees of the park, each was a synthetic marvel of mutated life.

Hearing a step on the gravel walk behind him Castellani turned sharply, to find the president boring into him with his hostile, sombre eyes.

"Your pets?" Castellani inquired animatedly. "They are beautiful."

The president made no reply for several seconds. If ever there was murder in a man's eyes, Castellani saw it in the president's then. They were alone, far from the nearest human being. It flashed into Castellani's mind that the president had seen him leave the laboratory, and had followed him with sinister intent.

The president ignored the question. "I followed you from the laboratory," he said, "to warn you."

"Yes?" Castellani encouraged, watching the president's hands.

"The first victims of the plague were suddenly stricken in this section of the park. The ground may still be infected."

"Why did you not warn me before?"

"The infection seems to have died out here," the president replied evasively. "There have been no new cases in this park since that first outbreak. It lasted only two days. Still, I thought you had better be warned. The plague may still be active in this vicinity."

"I see," Castellani replied. Indeed

he did see exactly what the president was driving at so indirectly. How easy it would be, the little man reflected, for the president to murder him where he stood and have his body consigned to the electric furnace before reporting, with deep regrets, that the distinguished Italian biologist had perished of the plague. The chief's twenty hour session with him was adequate enough motive for murder to a man who, Castellani had decided, wished to conceal something from the international police. "Tell me about those deaths here," he suggested quietly.

"THERE were several," the president replied frigidly. "Fourteen of the gardeners and eighty-three of these birds that you find beautiful. Only the low-flying birds died. Those that perch high, and take their food from the fruits on the trees and the berries on the taller shrubs, survived."

"Interesting," Castellani murmured. "Interesting. Are you walking back to the laboratory?"

"Perhaps. You and the chief discussed the plague last night?"

"It was a visit of friendship. The chief needed a rest," Castellani declared lightly. He flattered himself that he could lie.

"You can rest while my people die daily by the thousands?"

"Only that I may be refreshed for harder work. We have made no progress, I think. You agree?" The president nodded stiffly. "Then let us return to the laboratory and work. I am refreshed."

"If you wish. May I show you some data in my office?"

"If there is time. I shall be glad—"

He was interrupted by a hoarse, strangely human cry. It seemed to come from a point a quarter of a mile east of the aviary, and that much farther from the nearest laboratory building. Castellani listened intently for a repetition of the cry. It came almost instantly, a yell of unintelligible jargon.

"Someone is in distress," he said, darting down the path in the direction of the sound.

"It is nothing," the president panted, racing after him. "Come back! It is nothing—we have no time—." But Castellani, outdistancing him, continued to run.

He was brought up short by an enormous grill of stout bars surmounting a high stone platform. It was in fact a large cage, such as one sees in the dangerous animal section of a zoo. Castellani stepped back and saw the cause of the disturbance.

Two huge apes had been quarreling. The defeated combatant, a female, cowered in the far corner of the cage, while the victorious male stood menacingly over her, one powerful arm raised to terrify her.

Castellani watched these almost human apes with absorbed interest. Here at last were the pets of the laboratory workers. The male, satisfied that he had subdued his unruly mate, lowered his arm and retreated, shambling toward the opposite corner of the cage. Instantly the female was on her feet, screaming curses and abuse after her god and husband.

The retreating ape turned, raised both his arms high above his head, beat his knotted fists together in a paroxysm of rage, and answered her curse for curse. It was a friendly family row, as intimately ferocious as are all primitive expressions of sexual emotion. So fascinated was Castellani that he did not feel the president's tug at his sleeve.

"Come away," the president insisted. "I am late already for an important appointment."

The apes had sworn themselves speechless. Finding nothing further to lay his tongue to, the male shuffled to his corner, and the female, equally at a loss for words to embody her hatred of him, ambled to her own.

"But these savages are interesting," Castellani protested.

"They are only apes. Come—"

"Apes? Impossible! Apes are lower animals. Only human beings have the so-called divine gift of speech."

"These apes do not speak!" the president spat in a sudden fury.

"I heard them," Castellani retorted firmly. He remained quite cool. "Why have you concealed this so important achievement of your scientific staff? For a century we other biologists have exhausted our patience and our ingenuity to bring about such a reaction. The ape is more than half human. With the godlike faculty of speech he would be

human. He would reason—he does, dumb as he is—and he would pass his acquired knowledge to his children. How have you added this missing factor of speech to the cells of the unborn ape?"

"If they speak, as you say they do," the president replied slowly, "we do not know why. It is due to an accident."

"You have more of these so interesting human apes?"

"Yes. I will show them to you tomorrow. We must get back now."

"This time I will come with you," Castellani assented readily. "But only so far as the front steps of your main building. You shall go inside and call an express for me. The chief, when you ray him, will order one of the patrol cruisers to come and fetch me."

"You are afraid of the plague here?" the president suggested with well simulated scorn.

"I thought you were a biologist, familiar with the ways of death," the president remarked with cold contempt.

"And of life also," Castellani added. "The ways of death are not unpleasant."

No more was said till they reached the main entrance to the laboratory. The president went in to call a cruiser, as Castellani had requested. The little biologist did not even mount the steps, but stood well out in the courtyard.

After a few minutes the president emerged with Castellani's satchel in his hand.

"I have packed the more necessary of your personal effects," he said. "I trust you have enjoyed your visit at my laboratory?"

"Greatly. The express cruiser is coming?"

The president nodded, but said nothing. Presently the expected cruiser appeared directly overhead, and in a few seconds had landed in the courtyard. The steel doors slid back, and the president bowed Castellani aboard. The steel doors closed. The president stepped to the pilot's window and called for the commanding officer. Then, in his own tongue, he gave a series of sharp commands. The officer saluted and retired. In ten seconds the soaring cruiser had passed out of vision.

The president walked soberly back to his office. He had just played another of his desperate last cards.

CHAPTER XIX

General Alarm

ON his return to London headquarters, the chief found an alarming report waiting him on his desk. The International Secret Service had made a thorough search for the missing Yandell. They had been unable to trace him. But they had made a disturbing discovery. The member of their force who should have been the last to shadow Pobby had disappeared. No word had been received from him for nearly five weeks.

Under ordinary circumstances a failure to report for such a length of time would not necessarily be significant. The man might be engaged in routine observation. As for Pobby, after the police became satisfied that he was a harmless sort of idiot, it was agreed that formal reports were superfluous so long as Pobby's amiable fatuities got him into no mischief. In the present crisis however, the failure of the detective to report, and his complete disappearance, took on a decidedly sinister tinge. Knowing what he did of the terrible sanitary efficiency of the oriental officers in the plague districts, the chief concluded that Pobby had been one of the earlier victims.

"Poor devil!" he sighed, and rayed Merriman.

Merriman listened in silence to the chief's tragic news.

"We may as well give him up for dead," he agreed when the chief finished. "Poor Yandell I shall never forgive myself for having sent him to his death."

"You did nothing of the kind," the chief stoutly asserted. "If you are to blame, then I am too. His tour was under my jurisdiction and under the supervision of my forces."

"Technically that may be true," Merriman admitted. "Humanly it is false I shall see that he is fittingly remembered."

The chief made no reply. He was only too acutely aware that some trusted man of his usually irreproachable force had fallen down on his job. The thought made him uneasy. Were others of his world staff incompetent or dishonest?

With a hopeless sigh he took up a sheet of reports on his desk and plunged into work. Presently he was sound asleep, worn out by the grind of the past two days.

He was awakened some four hours later by the slamming of a door and the excited cries of a man who was trying to tell him something. Starting up, he saw the head operator of the central switchboard wildly waving a yellow slip of paper at him. The man could scarcely speak.

"This just came over," the man panted. "We don't know where from."

The chief snatched the slip. This is what he read.

"I 111. Arrest Chou. The plates. Castellani—"

"Yandell's number on the A. B. C. code," the chief exclaimed. He sat down, deliberately, rubbed the sleep from his eyes, and bent over the yellow slip.

"Where is the rest of the message?"

"No more came over, sir."

"I see. Ray these at once." The chief tossed the operator a pad and a pencil. Then he rapidly dictated three messages to the operator. Having taken them down, the man darted from the room.

When the president of the laboratory entered the building after having seen Castellani safely aboard the express cruiser, he stood absolutely motionless for some moments in the reception hall, trying to decide upon his next move. At last his mind was made up. He had but one more card to play. Should this fail to take the trick, the game was lost, not only for him, but for all his people.

Having decided to play his last card, the president flitted down the corridor to the central call room. He himself, brushing the servile operator aside, broadcasted to all of the laboratories in Zedten, in the secret code, a single order. If within half an hour that order were not rescinded, no human power could save the human race. The operator, a skilled metallurgist detailed temporarily to the all important task of spying at the central switchboard, understood the import of the message.

"You will not—?" he began, when the president had deadened the transmitter.

"I will," the president replied coldly.

"Then we have succeeded?"

"No. But we shall."

And with that iron assurance he left the operator to brood in solitary fear.

THE president had decided. Thirty minutes, and the game would be won or lost. He himself did not know which. The rugged lines of his impassive face deepened as he entered an elevator, closed the doors behind him, and pressed a button. Getting off at the fourth story, he made his way for a quarter of a mile down a quartz-lined corridor, till he came to a door without letter, number or plate to indicate what might be in the suite of laboratories behind it, or who worked in them. Taking four keys from a small bag suspended about his neck, under his blouse, he fitted them one after another into the specially constructed lock, gave each its proper backward and forward turn, and lightly put his shoulder to the door. It swung open. Entering, the president carefully locked the door from the inside. The door was of titanite, and the lock unpickable.

The president found himself in the luxurious living room of a suite of first class research laboratories. This was in fact the suite reserved for distinguished foreign guests who, once or twice every five years, requested the privileges of the greatest laboratory in Zedten. An occidental might have criticized the opulence of the decorations and the too inviting seductiveness of the heavily cushioned lounges and chairs, with their rich drapes of oriental rugs and curiously patterned silks, but he could not have denied that the effect, in its kind, was what it was intended to be, and perfect.

Passing into the equally luxurious dining room, the president instantly noted that the last meal, prepared with supreme skill by two trusted chefs, had not been touched by the occupant of the suite. Was this invaluable man dangerously ill?

The president controlled his agitation as he walked quietly through the libraries and tool rooms, all disguised in the same oriental artistry as the radio booth, till he came to a plain vermilion steel door numbered seventeen. This room, he realized with a qualm, overlooked the courtyard in which he had just bidden Castellani godspeed. The windows, however, were of quartz, four-

teen inches thick, unbreakable, and not to be opened. They had been so constructed, long ago, wtih infinite oriental foresight. It might some day be necessary to prevent a distinguished guest from shouting down to his friends in the courtyard that he had seen the apes that talked like men.

The door of number seventeen was ajar. The president entered. A haggard man glanced up through the jungle of quartz and titanite and steel which was his apparatus in the crucial experiment on which he was engaged.

It was not by accident that the researcher worked by preference in number seventeen of all the faultlessly appointed suite of laboratories. Hoping against hope, and all but praying for he knew not what kind turn of fate, he spent most of the daylight hours by the quartz windows, staring haggardly down into the barren courtyard. At night he worked feverishly between tortured snatches of unrefreshing sleep tormented by hideous nightmares. In the task that he had assigned himself he was no expert, not even a competent amateur, and the dread that death might overtake him before he should succeed, made his days an agonized stupor of watchful suspense and his nights an unimaginable hell.

For some seconds the president stood silently gazing at the wasted wreck of a man before him. Since his luxurious incarceration the prisoner had lost nearly fifty pounds. He was naked to the waist; the stifling humidity had driven him to the limit of his civilized decency. At this moment he was little more than a parcel of bones loosely held together by a rumpled sack of sagging sinews.

"Are you ill?" the president faltered. "Three days ago you were not like this."

The living corpse made no sign.

"Do you hear me?" the president insisted, more sharply.

The man spoke.

"Sit down, you. . . ." No one who had known Yandell a short two months ago would have recognized the voice, the tone, the vocabulary, or the scathing contempt as their friend's. Nor would they have seen more than an elusive memory of the man they had known and disliked in this emaciated wreck glaring at his enemy through the jungle of quartz and titanite.

"Sit down," he repeated, harshly. Yandell's oratory, like his superfluous flesh, had vanished. At last he had got down to the primitive core of manhood which animates even the basest of mankind.

THE president slowly sank onto a bench beside the work table.

"Yes?" he said.

"I have succeeded at last," Yandell resumed. "I am glad you came."

"You can halt these disastrous disintegrations?"

"No."

"Then you have failed, not succeeded. You are not in your right mind."

"I have succeeded," Yandell persisted fiercely. He went on with his work.

"How have you succeeded?" the president demanded. He felt that he was dealing with a man driven mad at last by the horrors of his confinement and the iron compulsion to accomplish a task he rebelled against.

"I am a metallurgist," Yandell declared, "not a biologist. As an expert on metals I have succeeded. As a biologist, I could not even begin to fail. The progressive disintegration of the traces of titanium in the upper few hundred feet of humus and soil must continue until the last atom of the disintegrating element is annihilated. No predictable agency can stop the conflagration until it has burned itself out, and the last atom of titanium has disintegrated. By your ignorant tampering with processes beyond your understanding, you have brought about the destruction of your civilization. The plague is beyond my sphere.

"All that I know is this: it is caused by secondary radiations from the atomic disintegration of traces of titanium in the upper soil. And no known counter-reaction can stop it. For all I can predict, this cursed plague you started by your blundering attempts to operate the hydrogen-helium transformation, must continue to spread over the whole globe until the last human being has died in stark madness and intolerable agony. I saw one of them die. An old man, a poor thing that had deserved no such hell, here or hereafter. His fate, and no other, shall be the lot of the human race."

"You call this success?"

"In the problem you proposed, yes. You asked me, on pain of death, to find

the means for halting this explosive disintegration of the titanium in the soil. Your own slow-witted drudges had traced the plague to the secondary radiations from those progressive spots of rotting matter. I have proved that the destruction of titanium must continue indefinitely. No known radiation can sufficiently damp the vibrations of these hard rays to quell them. The plague shall sweep the earth. Then we shall forget our ambitions for our nations and for the human race."

For several minutes the president did not reply. He sat like a stone, watching the man behind the apparatus busied with his experiment. In his secret mind the president doubted the sincerity of the emaciated man whose spirit he had tried in vain to break. Was he as ignorant, or as mad, as his theories proclaimed him to be? Was it not obvious that the disintegration of the titanium in the upper soil, with its disastrous secondary radiations that transmuted animal cells to plant cells and plant cells to animal cells, with the consequent degeneration of human and animal nervous tissue to masses of fungoid growths—was it not obvious that all of this could be halted by a simple application of modern engineering?

The spotted colonies of disintegrating titanium could not, by any physical possibility, send their degenerative rays down through more than a cubic mile of soil. One active spot in the loose crust touched off the next richest center; the disintegrations travelled sporadically, spreading like a pest of bacteria-bearing insects, in a complicated pattern of infectious foci over the whole territory open to their attack. What more simple than to isolate the infected region by a trench two miles deep and two miles broad?

The world engineering forces could accomplish the task in a month. The air need not be exhausted above the colossal ditch, for it had been shown abundantly that ten metres of air were sufficient to damp the strongest of the secondary radiations. The decay progressed from atom to atom of titanium in the soil; its life and range in media free from titanium were extremely short. The immediate means of halting the plague from sweeping the whole world were therefore at hand.

How had Yandell overlooked this? The president, shrewd as any oriental ruler of the first order, decided that Yandell was lying. Under the cloak of extreme physical exhaustion and great nervous tension, the prisoner was feigning insanity. That, of itself, mattered little. What had the man actually discovered?

Yandell was, the president knew, an expert of the first rank in metals; otherwise he would not have spared his life. The metallurgical experts in the laboratories were baffled. In using the hydrogen-helium transformation—or rather only its first step—deduced from the stolen plates, they had blundered grievously. Not one of them knew how to correct the blunder. Yandell, the expert from the Observatory from which they had stolen the plates should know.

YANDELL, either from necessity or from loyalty to the human race, had refused. In view of the facts, it must be conceded, even by those who disliked Yandell, that necessity born of ignorance was not the parent of his obstinate silence. Almost in the first hour of his attack on the problem which the president placed before him, while the horror of the lethal chamber still stifled his mind like a pall, Yandell recognized that the progressive disintegration of the titanium in the loose soil could not be halted by human means. It must burn itself out, naturally, until not a single atom of titanium remained in the upper soil.

And, stunned by what confronted him in those first dreadful hours, he had nevertheless worked out the only possible means of confining the fungoid plague to a prescribed area. His solution coincided with that which had just flashed across the mind of the president. Indeed it was obvious that this was the only way out. It should have occurred immediately to the mind of any expert. Why then, the president mused, had it not occurred to Yandell, expert that he was in the breeding of metals?

The president's answer to his own question was correct. The haggard man, stripped to the waist and unkempt as an untended madman, was sane with a deadly sanity which would watch its chance, and, when the opportune moment should come, which comes to every man of intelligence who is prepared for the

unexpected, strike.

Studying the fiercely contemptuous face of the man before him, as the emaciated frame bent over the tubes and crystal rotators, the president decided to play his last card. Should this fail, he was done.

"Let me tell you the history of this laboratory," he began. "Are you listening?"

Yandell gave no sign that he had heard the president. At the moment he was delicately breathing upon two platinum filaments, suspended by a tiny bar of auranite, in an endeavor to enmesh them without completely merging their identities in a single fibre. The president continued his monologue.

"Two generations ago," he resumed, "the scandal of the titanium affair shocked a world grown accustomed to large dividends and cloying luxuries. Are you listening?"

Yandell gave no clue to the thoughts racing through his mind. He had just succeeded in uniting his platinum filaments. This would increase the efficiency of his crudely constructed apparatus, his last hope, and the last hope of the human race, a full fifty percent. He then bent over his work bench without a tremor.

"As breeders of metals," the president resumed, "we passed to the first rank and became a world power. But that was not the most important gain from our first theft. It was early discovered that the stolen data contained much more than the obvious key to the art of metals. By applying this deeper information to vary the process of manufacturing metals of the greatest densities, we succeeded in generating discontinuous pulses of a new energy of high frequency. Our biologists, following the early work of yours, applied this new energy to genetics. They were successful beyond their most daring expectations. Their first work, and that of which the world at large has seen the results, was with plants. Over twenty thousand new species of plants were created by our biologists in the first ten years of their research.

"This, however, was but the first step toward the ultimate goal. By an intensive study of those new plants, our geneticists mastered the laws of the new energy and learned to control it in their experiments. They predicted that it would be capable of modifying the fine structure of the chromosomes of animal cells—those features of the structure to which the so-called higher faculties of animals have been traced. Need I elaborate the implication?"

"No," Yandell replied unexpectedly, glaring dangerously at the president.

"One generation," the president mused, "bred under the right conditions, will give the nation possessing the secret of those conditions world supremacy. So far," he admitted hopelessly, "our biologists have not succeeded in improving the higher faculties of human beings. Our attempts in that direction have resulted in things which we were forced to destroy. Our one success has been with apes. Many of our biologists believe that we have created a race of higher apes endowed with speech; I myself make no such claim. Why, then, have we failed to advance our race?"

"Because you have gone at it the wrong way," Yandell replied viciously.

"Then you will put your knowledge at our disposal? I have told you everything," the president said with slow emphasis, "as a last appeal to your good sense and your humanity. We are desperate. You must help us, or—"

"Or what?" Yandell demanded, bending over the keys of the instrument before him. His work was finished; the last delicate filament was installed. For four weeks he had slaved over this crude thing, which only an expert would have guessed to be what it was—the transmitter of a long distance radiophone. To his inquisitive jailers he explained that he was constructing a rayfilter of a novel type recently evolved at the Observatory, in order to investigate the radiations responsible for the plague. From elementary texts in the splendid library of his suite he had laboriously mastered what to him was a new art, but which many a high school boy pursues as a hobby.

The president concluded his sinister threat.

"If you refuse to help us," he said with dull emphasis, "we shall be forced in desperation to use all of the information which we have read from the plates. We shall employ the hydrogen-helium transformation in its fullest extent. Before I came in to see you I gave the orders to proceed in half an hour. Only

you can stop our metallurgists from putting the complete transformation into immediate operation."

"Your men will not dare," Yandell declared confidently. "Orders or no orders."

"They shall!" the president almost shouted, an insane light in his eyes.

YANDELL stared at him, a horrible doubt in his mind. Was the man stricken by the plague? Slowly the truth broke upon him. The president's genius was, and always had been, of the kind that is two-thirds sheer madness.

"You simply will not dare to let the full transformation go through, even in only one of your laboratories," Yandell insisted, with calm, scientific conviction. "Even at the Observatory they do not yet know how to control the evolution of energy in the complete process."

"We shall use it. At once. The full transformation is the secret of human evolution!" He strode to the door. "At once! Do you understand?"

Yandell did. His trembling fingers depressed five crystal switches. This was the moment for which he had endured weeks of hell in a fight against enticing death. He had not failed. But would the primitive instrument be equally faithful? There was a crackle of green sparks. The president heard, and wheeled instantly. Before the madman had smashed the transmitter, Yandell had broadcast the first, sufficient words of his world alarm:

"I 111. Arrest Chou. The plates. Castellani—"

Panting from his exertions, the president hurled away the chair with which he had smashed the crude radiophone, and confronted Yandell. The same look came into his eyes that had frozen Castellani by the aviary. Then, of a sudden, his face underwent a horrible contortion, and he laughed. The paroxysm all but strangled him.

"You fool," he choked. "Oh, you fool. You have helped us in spite of yourself. They will never trace the plates to us now. Chou? He is not one of us. Chou stole the plates? I doubt that he ever heard of the hydrogen-helium plates. They will question him, and lay his silence to his Chinese stoicism. Then they will execute him, and we shall have the secret forever. Forever! We shall be the greatest nation in the world!"

Yandell almost collapsed. To have blundered after all his agony to succeed made his brain spin. He scarcely heard the madman's sentence upon himself.

"You know too little and too much," the president crooned. "Come with me. One white, one red—"

Yandell did not wait till the madman's hand touched his bare arm. Instinctively he had seized the heavy stool upon which he had been sitting. Before he realized what he had done, he was bending over the president's prostrate body and rifling his pockets for the keys. Finding them, he darted from the room, with a last glance at the bleeding gash on the fallen man's forehead.

The attendants, having heard the fracas, met him half way to the door of the suite. Yandell himself was now temporarily out of his mind. Those who tried to stop him were as matches to his maniac strength. Reaching the door, his sanity reasserted its reign, and he coolly tried the four keys until he had found the combination. Then, cautiously opening the door, he peered out. The long hallway was deserted. He stepped out, and locked the door behind him.

For half a minute he stood perfectly still, collecting his scanty memories of the building. Presently he felt sure of himself. He flitted along the endless corridors to a distant stairway, and made his way down to the ground floor. His memory had served him well. The room he sought was only a hundred yards down the hall in which he found himself.

The door was ajar. Entering, Yandell peered cautiously about for some weapon. There was nothing. The man at the central switchboard sat rigidly watching the rows of call buttons on the board before him. This, Yandell had long since realized, was the enemy's chief spy. In a flash he had knocked the man off his stool. Swinging the stool high above his head, he brought it down with all of his force, disabling the operator, but not killing him. Even to save his life, Pobby would have hesitated to kill a fellow human being.

He pored over the switches, and found what he wanted. Oh, to be an expert in this trivial sort of thing for a second, or only an uneducated operator!

"I must not fail; I must not fail!" he kept repeating, as he laboriously blundered to select the switches he needed. The key switch, giving the location of the calling station, was already depressed. So far he had succeeded. He had turned in a world call and had given his own station.

The whole world was now listening for the expected message. Why did it not come over? Millions of operators all over the globe wondered in their comfortable offices and the signal rooms of their swift helioplanes. Was this a practical joke? What was the matter with the man at headquarters in Zedten? He must be drunk. A world call, and nothing to say. A full hundred thousand exasperated operators began demanding what the devil was up.

THE sweat poured down Pobby's face and naked chest. Every man in the laboratory with his radiophone connected was hearing those clamorous protests. They also would be wondering what the devil was up in the central call room. Had their chief operator fainted? Pobby heard a tide of footsteps rushing along the corridor.

"I must not fail," he muttered, depressing the final switch. Ah! he had got it at last. Into the now viable transmitter he rapped his short sentences.

"I 111. Helium-hydrogen plates here. They will use full transformation immediately. Destroy all laboratories in Zedten. Chou—"

He was hurled to the floor by five infuriated men who had dashed into the central call room on hearing, on their own radiophone, the bizarre first call. Others, a multitude, were now hurrying to the scene of battle.

Yandell was on his feet instantly. He grasped the only weapon in the room—the stool—and crashed his way out. Glancing back at the doorway, he saw one desperately wounded man leaning over the switchboard and gasping into the transmitter. The snatch of the message which he overheard, in the International emergency code, was an urgent call to all workers in the laboratories of Zedten to evaculate their buildings immediately and flee to the open.

Through the milling mob of men and women fighting their way to the exit, Yandell forced his way unnoticed. They were fleeing for their lives. Presently he found himself in the courtyard, spewed out in the torrent of panic-stricken humanity. Glancing overhead, he strained his eyes against the sultry copper vault of the sky. Nothing was visible. Then he shouted.

A cloud of barely visible specks was suddenly printed on the copper vault; they assumed size and shape, and the crescendo roar of their descent shook the air and made the ground tremble. These were the massed legions of the squadrons of destruction concentrating on the industrial region of Zedten in response to the chief's orders rayed from London. As one unit, in answer to Yandell's second call, they were now converging upon the central laboratory of Zedten to destroy it.

Yandell found himself, with a hundred others, in the open fields before the first bolt struck the highest tower of the fifty-story laboratory.

Not for over two hundred years had there been a war of extermination. How efficient were the defenses of humanity? Had the experts erred in declaring that no guilty nation could escape the penalty of its crime?

They had not erred. Their sudden answer stunned the fortunate wretches who, like Yandell, had escaped to the open. Those still in the courtyard knew nothing. To them all doubts, all frustrated ambitions and all anxious hopes for the selfish supremacy of their race over their fellow races, instantly became less than dreams.

The torrid sky leapt down in a sheet of blinding white fire. There was no noise, no fanfare of exploding shells. The sky simply became the withering roof of a cold white furnace.

Glancing back, Yandell saw the towers and massive fifty-story blocks of the laboratory vanish without so much as a wisp of smoke to commemorate their passing. He staggered off down a street that somehow seemed strangely familiar. It was that by which he had entered the town.

At nightfall, not knowing where he was, he stumbled into a devastated rice field and slept.

Some twelve hours later the desk clerk at the hotel where Pobby had stayed on his fateful trip was startled to see an unkempt maniac glaring over the desk.

The man was naked to the waist, and his straggling hair and beard hung in draggled wisps down his emaciated chest and bony spine.

"Call International Police Headquarters," the man commanded in a voice which sounded perfectly sane. The clerk obeyed.

"What message, sir?" he asked. There was that in Yandell's bearing which would make almost any man address him as "sir."

"I will speak myself." He leaned toward the transmitter. "This is I 111. Yandell," he said. He gave his location. "I am nearly under," he replied in answer to the chief's hurried question. "There are just two things I must say before I sleep. Has Castellani returned? No? Then he is dead. Where is Chou?"

Over the radiophone came a crisp reply.

"He is awaiting execution in the federal prison at Los Angeles."

"Release him. He is innocent."

"But Hardinge—" the chief protested.

"I know. But he is innocent. Innocent! Release him—"

The clerk managed to clutch Yandell's arm before he collapsed.

"Castellani—" he muttered as he fell.

CHAPTER XX

Tomorrow

WHILE the war of destruction was at its height, and the skies above the province of Zedten flashed into intolerable white fire as one after another the laboratories were destroyed, a second, minor engagement was being fought out at the hundred thousand foot level in darkness above the oceans on the farther side of the globe.

One swift cruiser, defying the order of the officer in command of its pursuers to surrender, soared and dipped, darting erratically hither and thither in its desperate attempts to manoeuvre itself into the superior position which would enable it to strike one of its ten enemies. But the officers of the pursuing squadron, remembering the tactics of the enemy above the Amazon jungles, eluded the would-be assassin, frequently by the margin of a scant yard, never permitting themselves to be caught within plunging distance of the murderous titanite pillar.

The enemy cruiser was an ordinary patrol helio, unequipped for war; the ten pursuers were fully armed major cruisers of the international forces, and could have annihilated the enemy at any second of the chase, had they not preferred to take him alive if possible.

The first thought of the commanding officer when the rebel flashed through his sector of the cordon isolating the plague district was that the pilot of the runaway, having flown too low, had been stricken by the plague. The superb skill of the escaping pilot, however, quickly convinced him that the officers and crew of the escaping cruiser were perfectly sane.

The first order to halt having been disregarded, the commanding officer summoned nine of his subordinate cruisers to aid him in forcing the enemy down. But the enemy was not to be forced down, except as a desperate last resort. The president had so ordered, and disobedience meant certain death, while rigid obedience offered at least a gamble for life. Knowing that he would be instantly followed once he had broken through the cordon, the pilot had shot to the higher levels and sped toward his only refuge—the sheltering night on the farther side of the globe.

On entering the cruiser which the president summoned for him, Castellani did not immediately suspect that he was a prisoner. The steel doors had scarcely closed behind him when he knew. Through the open gangway to the bridge, he heard the president's staccato orders to the officer in command. Although he understood not a single word of the president's speech, he guessed its import correctly—or at least the less unpleasant part of it.

He was a prisoner. His biological knowledge was too valuable to his enemies to be lightly lost. On the other hand, his discovery of what the local biologists were up to, made him too dangerous to be at large. Why, he demanded of himself had he not summoned his own cruiser directly from the chief, instead of practically inviting the president to jail him? Then he thought

with a poor attempt at hope, that London would soon miss his reports and demand to know what had become of him. He would be found—he felt sure.

Suddenly a sickening memory made him dizzy. The president had warned him that the gardens had contributed their quota of plague victims. Perhaps at this very instant the president was condoling with Merriman over the death of that so brilliant biologist, the lamented Tullio Castellani, who had just been cremated. He would moulder his life away in some dingy laboratory, slaving against his will for his enemies.

What Castellani had not guessed was this. The president knew that his man had but a slim chance of breaking through the cordon of the International forces to any city of Zedten beyond the plague area. He provided for this in his orders. The cruiser was not to permit itself to be captured. Should the pursuit become too hot, the cruiser was to shut off its power and crash from as great a height as possible. The president was relying upon the officers; the thirty men of the crew, though less highly trained, could be counted on to obey—in the blind ignorance of their perfect military discipline.

To Castellani, more or less of a novice at flights in the higher lanes, and totally inexperienced in the discomforts of rapid manoeuvring, the flight of escape became a nightmare. Barely conscious, he lay groaning on the steel floor of his cabin. His sense of time, naturally confused by the rapid passage of day and night in highlane flights, evaporated. For all he knew he might have been aloft a week or only half an hour, when suddenly a new terror gripped him, and tried to rise, conscious of what was happening.

The whirr of the stablizer had ceased and the motors had gone dead. They were falling through the night with terrific speed from the hundred thousand foot level. In eighty seconds he would be a smear of unrecognizable pulp.

THE officer in command had decided to obey his president's final order and end the flight, although his orders did not cover the present emergency. A world alarm had just flashed up on the signal board. He had heard the order from International headquarters in London for the destruction of the laboratories of Zedten. To return to his native country and deliver the prisoner to one of the laboratories was therefore impossible. To his military mind there remained but one way of executing his orders: stop the motors and cut out the stabilizers.

The general alarm was of course also heard by several of the crew. Their conception of duty was less rigid and more reasonable than their officer's. If the world forces had declared war on Zedten, their compatriots were already hopelessly defeated. Why throw away the only life one has when by surrendering to the victorious enemy one may still live, if only in a prison?

"Surrender!" they yelled, dashing for the controls. In the fierce struggle of forty seconds that ensued the pilot and the chief officer were killed.

The navigating officers of the pursuing squadron, their eyes fixed on the erratic spark darting back and forth like a firefly among nine steadier sparks on the ground glass of their position indicator, saw the mad spot suddenly shoot in a straight line diagonally across and down the glass.

"Stalled!" they cried. "They're done."

The ten pursuers dropped simultaneously to witness the end of their enemy. Presently a spark glimmered for an instant at the very bottom of the indicator, vanish, and again came into view. Then it climbed slowly to the centre of the glass. Ten navigators uttered almost the same exclamation.

"They're on again!"

At the same instant ten call boards were flooded with green light, thrice. It was the signal of surrender in the International code.

Acknowledging the signal, the commander of the squadron ordered the enemy to halt where he was. Simultaneously the squadron dropped to surround the enemy in a close ring. Then, in that formation, they escorted the rebel cruiser to the nearest landing stage, some fifteen hundred miles away. Any attempt to escape, they warned, would mean instant destruction.

Two hours later a very sick biologist was trying to explain his situation by radiophone to International headquarters. But as he had forgotten his

own number, and his facts were all hopelessly muddled, the officers of the squadron put him to bed and told him to wait till his head cleared. Not till early the next morning did Castellani succeed in making himself understood. At an order from the chief, one of the cruisers whisked him back to the Observatory.

On receiving Yandell's last message from Zedten, the chief had acted immediately. He first rayed the Los Angeles Federal Chief of police to postpone the execution of Chou until further orders. Not that the chief himself believed for a moment that Chou was innocent. Hardinge and he had agreed on Chou's guilt long before they got Yandell's second message with its peremptory advice "Arrest Chou." They had not arrested him before in the hope that some further indiscretion on Chou's part would deliver him into their hands.

Having halted the execution temporarily, the chief proceeded to question the proprietor of the hotel in Zedten from which Yandell had sent his last message. Over the radiophone he learned that Yandell was in very bad shape physically and had in fact collapsed. The chief gave orders for proper medical attention, and disconnected.

"Chou is guilty," he declared to himself. "No chain of circumstantial evidence as strong as that can be broken." He called Merriman and explained the situation. "Yandell," he concluded, "is out of his head, apparently. His last report is clearly absurd. Chou *can't* be innocent."

"We must wait till Yandell recovers," Merriman advised, "before doing anything we can't undo. By the way, if Yandell is wrong on this, how do we know he was right on the rest? We can't rebuild those laboratories we have just annihilated, in a week."

"I have had that part checked. Our men in the field out there have obtained dozens of confessions from the five hundred or so Chinese technicians who escaped. We were just in time. As Yandell reported, they were preparing, under the president's orders, to use the complete hydrogen-helium transformation immediately."

"We should have been wiped out, probably," Merriman remarked. "That man must have been mad for years." He paused reflectively. "Since Yandell was right on the other," he declared, "I'm inclined to believe that Chou may not have been the brains behind the theft after all, in spite of Hardinge."

"If so," the chief retorted, "he will have a hard time proving his innocence. Consider how perfectly the facts against him dovetail. First, Hardinge identifies the bandit plane as of Indian origin from the measurements of the mark left by the heel as it rested on the alkali."

"And he was very much surprised to learn that the plane *was* Indian and not Chinese," Merriman pointed out. "From the involuntary exclamation of Chou's when Hardinge spilled the soup, the men in the bandit plane were identified beyond doubt as Chinese."

"Yes," the chief acceded. "That is my argument. When that Chinese kitchen hand missed Hardinge and fell over the cliff himself, he practically condemned Chou then and there. Chou is the brain behind it all; the Chinese cook's helper was a mere pawn. Would an innocent man have made such an uproar as Chou did when Dakan tried to send him to the hospital? It was the obvious ruse of a guilty man refusing to escape, in order to delude us into thinking he had no reason for wishing to escape."

"POSSIBLY," Merriman admitted. "The police report his actions at the trial as those of a man terrified by what they call 'conseiousness of guilt.' The psyehological reactions also were those of a man feigning ignorance under a great strain. I admit all this. And yet I believe Yandell may be right."

"You must not forget," the chief reminded him, "that you yourself first suspected Chou of knowing more than he seemed to, when you became convinced of his intense nationalism. Even at the trial he was unable to conceal his prejudices."

"That is true. But it does not necessarily imply guilt. There is another thing we must clear up before condemning Chou. You have never believed, any more than Hardinge or I have, the genuineness of Bhattacharyya's confession. What is his relation to Chou?"

"It seems fairly obvious to me," the chief replied. "We have not yet reached

the bottom of this conspiracy. Before we are through, I predict we shall find all of the more backward Oriental races involved. Bhattacharyya is technically innocent. His confession, as all of us recognize, was a plain fraud. Why did he confess? Simply to do his part in the conspiracy by throwing us off the right track. With our suspicions satisfied, and the fact of his life sentence broadcasted, his friends in Zedten could proceed quietly with their unlawful work and perhaps complete it before we should guess that we had caged the wrong bird. Then it would be too late for us to retrieve our mistake.

"I advise his conviction with the express purpose of giving the actual thieves a false sense of security. They seem to have been as cautious as we were. Without Yandell's messages we should still be watching for their first slip."

"What do you say," Merriman suggested, "if we promise Bhattacharyya a full pardon if he will tell us the truth?"

The chief considered. "We might try it. Legally, of course, we have no right to hold him, knowing as we do that his confession was bogus. The man is not guilty of the crime for which he was convicted. Let us see what we can get out of him in exchange for a half promise to restore his legal rights if he tells us everything."

Half an hour later they were confronted with Bhattacharyya in the reception room of the prison. The Brahmin seemed to have thrived on solitary confinement. His face had plumped out and there was a serene, other-worldly peace in his eyes. He greeted his callers with his habitual dignity.

Merriman explained the situation, partly. For the moment he thought it sufficient to state that the plates had been discovered in Zedten. Bhattacharyya's reception of this announcement astonished them. The elderly Brahmin broke down and all but wept. The chief interpreted his grief as a lament over the misfortune of his fellow conspirators. Merriman scarcely knew what to think.

"The plates have all been destroyed," Merriman continued after a long silence.

The effect of this on the elderly man was even more dramatic. His face lit up with joy, and he broke into a glad prayer of praise to his own gods. For a moment he might have been standing knee deep at sunset in his holy Ganges, thanking the thirty million that they had made him like his fathers and not like the infidel spawn of the modern age.

In reply to the chief's promise of a full pardon if he would tell them the truth, Bhattacharyya confessed his part. He had lied, he declared with unmistakable sincerity, in the expectation of throwing the police hopelessly off. He knew nothing of the theft when he confessed beyond what they had told him.

"But why?" Merriman demanded.

Bhattacharyya's answer was quite simple. In spite of his occidental education and his profession as a scientist, he had grown to hate western civilization and all science the more he saw of them. Neither had made his people any happier, and he doubted whether they had done the occidentals themselves any good — a curious point of view, but debatable.

The ultimate purpose of the hydrogen-helium transformation was well known to him, and he considered it rank impiety. Man, he declared, might create new plants, or even new species of lower animals, but it was a sin against the life force itself to tamper with human beings. They were as they were intended to be. To seek to breed from mankind, by artificially induced mutations, a race endowed with higher mental and spiritual qualities was the ultimate blasphemy and the unforgivable sin.

THEREFORE, praying that the thieves would prove to be less skilful than the Observatory staff as scientists —a not unreasonable petition— he had lied to give the thieves security and to retard, if only for a century or two, the inhuman march of science. In the hands of the Observatory staff, the new knowledge could not fail to widen and deepen the gulf between his race and the western world; the thieves most probably would be slower of success, and they might even fail completely.

"Completely?" Merriman echoed incredulously. "You knew of the extreme danger connected with the hydrogen-helium transformation, which even we do not yet know how to control, and yet you hoped the thieves would blunder irretrievably?"

"Would not the utter destruction of

the whole human race and all its world be better," Bhattacharyya retorted, "than the impious thing you plan to encompass? I have long known what you hoped to learn from those plates. The use of cosmic rays on a world scale to induce mutations is too costly to be realized in our century. Your battery of focalizers on the barren mountains of the desert can not be duplicated in every city and hamlet of the world, even should it accomplish your evil purpose in the experimental stage. That, your scientists admit, will never be more than a laboratory experiment, to point you the way perhaps to a practical solution of what you call the great problem on a world scale. Your hope for the race is in the artificial generation, cheaply, of cosmic rays from the common things of this earth."

"Precisely," Merriman agreed. "And although the loss of the plates has given us a severe temporary setback, we shall succeed. The Observatory staff is already busy restoring the work this theft has destroyed. They learned enough from the stolen plates to see that the goal was within easy reach. The next time they will reach the goal, and they will have all the knowledge gained from the great experiment at the Observatory to guide them when they do reach their goal. Dakan has finished. Before the month is out we shall have begun the experiment we have slaved to set up for over seventy years."

"I cannot stop you," Bhattacharyya replied hopelessly. "I did my best."

"You did," the chief agreed drily. "Well, as you can't do any more mischief that I can see, and as you are guilty only of short-sightedness, I shall see that you are pardoned and sent back to your own country. You will be happier there."

"I shall," Bhattacharyya bowed. "When may I expect my release?"

"In a day or two. The judges will have to review the evidence first. In the meantime, if you wish it, I'm sure the governor will give you the freedom of this place and find you a comfortable room."

"Thank you, but I prefer the privacy of my cell."

Having completed the destruction of the laboratories in Zedten, the world forces immediately turned their attention to isolating the plague spot from the rest of the world. Even as Bhattacharyya returned to his cell to brood on the blight of modern science, the world engineers had scooped their first trench, two miles broad, two miles deep and a hundred miles long, in the impassable ditch that was to save Bhattacharyya's own race from the plague that spread like an unquenchable fire.

Six days later Merriman and the chief left London for the Observatory. Yandell had picked up sufficiently to return home, and would precede them by a few hours. Under excellent medical care he had already regained eleven of his lost fifty pounds. In all respects save one, he was rapidly beginning to feel like his old self. He had practically lost the desire to make speeches. Before leaving Zedten, he had his beard and hair trimmed again—they had already done something in that line at the hospital—this time to his own taste.

On arriving at the Observatory, Yandell slipped off to his own cabin. He had rayed Dakan that he did not wish to be met, or to see anyone until he rested. Yes, he would attend the conference with Merriman and the chief as soon as they arrived, if Dakan would send for him.

On entering his study, Pobby was touched to see that someone (it was Kate and Hardinge) had placed a bowl of fresh marigolds, his favorite flower, on his desk. If only he could forget what an ass he had once been, he foresaw a long life of work and marigolds.

"I shall never make another speech or write another report as long as I live," he vowed, sinking into an easy chair for a short nap.

Three hours later he opened his eyes to find Dakan silently standing by his chair, waiting for him to wake.

"You had a good sleep," Dakan said, shaking hands. "You're looking fine, although you could stand another forty pounds of meat on your bones."

"I'm feeling fine. The conference is to be in your office, I suppose?"

"Unless you would prefer to have them come here? The walk—"

"It will do me good."

Whatever may have been their secret embarrassment, those waiting in the office for Pobby showed nothing of it in their faces as they shook hands. They treated him exactly as if he were just re-

turning from an ordinary leave.

"Did you have a pleasant trip back?" Kate asked.

"So-so. The high level expresses always tire me a little." He turned to Hardinge. "The chief implied over the radiophone out there that you have some evidence against Chou?"

HARDINGE turned a dull crimson under his mahogany tan.

"If I once thought I did, I don't think so now."

"What has altered your opinion?"

"The president of the central laboratories in Zedten told me himself that our blunder in suspecting Chou would be our ruination. It was almost the last thing he said, before I hit him over the head with a laboratory stool."

In reply to their eager questions he elaborated his meagre statement sufficiently to convince them all, except perhaps the Chief, of Chou's innocence. The chief, suppressing his useless doubts, rayed to Los Angeles jail an order to free Chou and send him at once to the Observatory for apologies from Dakan, Merriman, Hardinge, Miss Douglas and himself.

"Please include me too," Yandell requested. "I suspected him from the first. That is why I asked to be sent on a world tour of inspection."

He had just well started his confession of blunders, when the call bulb glowed. It was Chou, asking for Dakan. Chou had not enjoyed his trial or his stay in jail. After his first indignant denials, he had resigned himself to silence. The evidence against him was too strong. Hardinge and the logic of circumstances had woven an unbreakable net about him; he was caught in the consequences of a crime he had never even dreamed of committing. His guilty compatriot in the kitchens, who had stolen a pass key and carried out the theft single-handed, was unknown to Chou even by sight. The thought of death terrified him less perhaps than it might have an Occidental. But the sheer injustice of his condemnation had bitten deep into his aloof soul.

Dakan answered the call. Chou made a polite request to be excused from attending the conference. Might he start at once on his sixty day leave, long overdue? Dakan granted the request immediately, and told him to have a good time.

Chou proceeded immediately to have the best time he had ever enjoyed in his life. Upon the startled ears of the conference an explosion of high-powered Chinese swear words burst like a thunderstorm. Their very ignorance of the language but increased their helpless confusion. Chou finished his short address just before Dakan, stunned by the bombardment, recovered his wits sufficiently to disconnect.

"If Chou is innocent," the chief declared, when the bombardment ceased, "I'm a fool, and I know nothing about evidence."

"Possibly," Pobby agreed. "The president out there convinced *me*."

"Well," said the chief, "it makes no difference now."

"It does make a difference," Pobby asserted quietly.

"To whom?" the chief demanded stiffly.

"To me."

"But I don't see—"

"You wouldn't," Pobby agreed. "If the president never told the truth, I have been deceived. Not you. Of all the statements the president made to me, there is only one that I accept without reservations. That statement was true."

The chief glared at Pobby. Pobby looked clear through the chief to the charts on the wall behind his chair.

There was a sultry silence. Hardinge raised the nervous laugh that averted an open quarrel.

"If you two had only one eye apiece," he confessed, "I was blind and squinted in both. Let's hear something amusing from Yandell's escapades. Go ahead, Yandell."

The storm over Yandell related briefly his own part in the comedy of blunders. Not for many a month did they succeed in worming out of him, a grudging sentence at a time, the story of his own heroism in Zedten. For the present he confined himself strictly to his initial mistakes, allowing himself only the luxury of one dig at his former enemy, Kate.

"My interest in the kitchens, Miss Douglas, was scientific, not culinary."

HE went on to explain that he had always distrusted the easygoing policy of the Governors which gave every

member of the staff, the absent-minded and the alert, passkeys to all the storerooms and data cabinets of the Observatory. His suspicions were first definitely aroused by a certain Chinese cook's helper, who seemed to do very little work. Checking on the man, he found that he was frequently absent for periods of from fifteen to thirty minutes when he should have been on duty.

"I confess," Yandell remarked, "to my initial stupidity at this point. It should have occurred to me at once that the man was rifling the rooms of those who had gone out to dinner, in the hope of finding a loose passkey lying about. But, like Hardinge, I missed the obvious thing while looking for something deeper. That, I presume, is the usual penalty one pays for having had a scientific education."

Like Hardinge, Yandell had concentrated on finding the higher-ups before openly accusing anyone of dishonesty. That there were no higher-ups, proved his undoing, as it had Hardinge's. Yandell was not deceived by the reticence of his friends concerning the true object of Merriman's "unexpected" visit to the Observatory; he even suspected Kate, before Merriman arrived on the Mountain, of having sent for him.

To a man of his observant habits, with a keen interest in the affairs of his friends, Yandell declared that the real purpose of the surprise visit was easily deduced from the evidence under his nose. Kate, he knew, had been assisting Hardinge in an analysis of the hydrogen-helium plates. They had been in a great hurry to get through with their work. Then, inexplicably, they dropped it when Merriman arrived, and in fact did no further scientific work. The numerous inferences were obvious.

At this stage, Yandell confessed, he made his second critical mistake in tactics. Instead of confiding his suspicions to the police, as he should have done, he determined to run down the criminals and recover the plates himself.

His plan of action was roughly Dakan's: to keep a sharp eye on the breeding of metals and act upon the first hint of a revolutionary improvement in technique. He suspected Chou. Therefore the industrial provinces of Zedten were his ultimate destination, to be reached speedily, but by a devious route, so as not to arouse suspicion. When the president first discussed the theft with him, he was convinced that Chou was the guilty higher-up. It was a not unreasonable jump to take a false conclusion; Chou was the one Chinese, other than the cook's helper, at the Observatory. With a brief apology for his mistakes, Yandell concluded his account.

For several seconds there was silence, except for a muttered protest, which they missed, from the chief. They felt that compliments, praise, congratulations would be important. The man they had secretly despised and openly jeered at had proven himself their equal, if not, in some respects, their superior.

"Shall we stroll up to the hutch and have a cup of coffee or something before dinner?" Kate suggested to relieve the tension.

"Did you order it?" Pobby demanded bluntly.

Kate joined in the general laugh at her expense, and they all became human once more.

It was still half an hour till sunset when they sauntered up the rocky path toward the hutch. Above the towers and domes of the Observatory, the colossal tripod of the nearest focalizer towered up, one of fifty, toward the pale topaz sky. Far below, the desert, blue and still in one of its rare calms, seemed to invite them to subdue its tempests.

"You say you have finished, Dakan?" Merriman asked.

"At last. All the focalizers are tipped to the richest region of the sky. We have finally found it, beyond a doubt, after all these years."

"The rays are already being concentrated, ten hours a day, on the test laboratories down there," Hardinge added. "The biologists report the most encouraging results on their preliminary runs with insects."

"You found all the volunteers you wanted?" Merriman asked. "I have been so busy I hadn't much time to help you, I'm afraid."

"Twenty times the number we can use volunteered when they got the call. We picked the six hundred most promising subjects for the actual experiment —three hundred men and their wives."

"When will they begin living in the test laboratories?"

"Tomorrow."



Conducted by DONALD DALE

This department is running a series of excursions to all the remarkable places you read about in science fiction. In a sense these are expeditions, for notes are made on the *probability* of the wonders we encounter—and any member is entitled to question them. If you've missed the first two trips, you're still not too late to join us. We will travel to places near and far, in space and time; and before we are done we shall make an even stranger journey that will bring us face to face with ourselves! Right now, as guests of the ruling race of the strange planet we visited last, and guided by two of the products of their master biology, we have just landed on their laboratory-moon.

"WATCH out for the jumping spiders—they are as big as *tigers!*"

Her newly-learned English comes with quaint charm from the lips of the lovely moon-maid, but her words cause us to look apprehensively about. The terrain of the satellite, like its parent planet, is burned a barren black from eons of the malignant radiation of K_{40}, or radioactive potassium. Nothing grows upon it, nor has it any place in sight where such a huge, nightmarish creature could lurk unseen. Behind us is the light rocket-ship in which we made this short hop, ahead perhaps a quarter-mile the high walls of the laboratory buildings, and between only the edge of a shallow lake.

Our gazes returned to the silver-eyed girl. Like the Moon-Man, our other guide, the corneas of her eyes have been tatooed to cover opaque spots—caused by the destructive radiation — that would otherwise interfere with vision. Her head is helmeted, her body sheathed in lead but, incongruously, her shapely legs are bare—except for sheer, opera-length hose.

Noting our glance, she "explains", her soft voice hesitating ever so little over the unaccustomed words. "The—radiation cannot — harm my legs, and —lead is too heavy for walking—so I wear these for—protection."

Before we can resolve this paradox, an exclamation of dismay from the Moon-Man distracts our attention. We learn that the anchoring apparatus of the helium-lightened ship is broken, and the ship cannot be left unattended.

But the Moon-Man's face clears after the silver-eyed girl has spoken a few words to him in their own strange tongue. Together they move toward the shore of the lake and we, curious, are close behind.

Walking out a few feet, the Moon-Man begins to wade slowly through the water parallel with the shore, scanning the bottom intently. Presently he halts, bends, and reaches into the water so carefully that not a ripple mars its surface. When he straightens up, he is holding, of all things, a huge, snail-like mollusk.

How is *this* to solve our difficulty? Questions pour from us as the Moon-Man wades ashore with the repulsive creature, pinkish-grey flesh oozing from under its shell. The Moon-Man flashes a questioning look at the girl, she nods, and he drops the mollusk roughly to the ground. Instantly an irregularly shaped protection flashes from it and buries itself in the earth. Then in response to the Moon-Man's challenge we try, singly and in pairs at first, then as many of as can find room to take hold, to lift the mollusk. But the weird creature, disturbed, has *anchored* itself down—and nothing less than dynamite will pry it loose!

The demonstration has made it necessary for us to obtain another "anchor". The Moon-Man is just lifting it carefully out of the water when the girl cries a

warning—but too late. We can see it, close beside our guide as he bends, in the shallow water—another mollusk. But this one's shell extends upward in a tube-shaped formation, and suddenly a *dagger* flashes out of it and stabs the Moon-Man in the leg!

Even before we can get him ashore, he begins to turn black, and as the girl quickly administers to him of a medicine kit, she explains that the mollusk's dagger-like appendage has hollow "fangs" like a snake's, connected with a poison sac in which it stores a venom more deadly than any reptile's.

But the immediate use of the antidote has the Moon-Man on his feet in a short while, albeit he is somewhat shaken, and it is not long before another impromptu anchor has been taken from the lake and attached to the ship's landing gear—as securely we hope as to the ground. We then turn our faces to the distant laboratories.

Suddenly a loud whirr of air fills our ears, the dull red sun is blotted out by a plummeting black shape, and we catch a confused impression of long, reptilian jaws and bat-like wings as the Moon-Maid is bowled over by a gigantic creature. The Moon-Man runs toward the lake, as the flying reptile's murderous claws slither down the girl's lead jacket, then rake across her thin-stockinged legs. Tranfixed by swift tragedy, we stare in horror—until we see that the clawing talons do not even tear the girl's sheer hose!

THOUGH she seems satisfied to lie still and cover her face, leaving the rest to the protection of lead-lined clothes and the incredible stockings, which appear even less vulnerable, we are frantically looking for some weapon when we see the Moon-Man racing back—with his helmet filled with water! We think he has lost his mind, particularly when he halts just out of reach of the attacking monster and *splashes the water down its back.* But an instant later the creature's body seems convulsed with some inner turmoil, a broad welt appears on its back—and *splits,* as a narrow snake-like head pushes through the rent!

Even before the enormous parasite has wormed its slate-grey body across the ground and disappeared into the lake, the flying reptile's death struggles have ceased and it lies quite still.

Somewhat bewildered by the weird fauna of this strange world, we finally get started once more. As we trudge across the plain, long shadows march ahead of us, but there is no warmth on our backs from the dying sun. The Moon-Maid, we notice, is intently regarding a dark spot in the crimson splashing on the high walls of the laboratory buildings far ahead.

"Spider!" she suddenly cries, and with her companion instantly drops to the ground. We would follow suit but there is no apaprent reason. We can see nothing except a brightly-colored butterfly slowly beating giant wings high in the air a short distance ahead. That and—Yes! In the distanee a black speck in the sky, *rapidly growing larger.*

In hardly more than a second, it seems, it has become large enough to identify—a monstrous, black-and-white spider rocketing through space with a glistening strand of grey trailing behind! The silken thread suddenly jerks taut, the spider's flight is abruptly arrested, and almost above our heads the spider takes its prey in mid-air. Then, before the grey strand has hardly begun to settle earthward, the spider is climbing it, returning with its prey nearly as fast as it came. And in a moment the dark spot has reappeared high on the wall of the laboratory—a quarter-mile away!

Spiders and Stockings

LET us, as we proceed to that place and the still greater wonders in store for us, take stock of the probability of what we have already seen. Why, so far as the various strange animals are concerned, all of them *actually exist* on Earth! We might have to go as far as the Red Sea for the mollusk we attached to our ship, but we would find we could pull it apart—if we were strong enough—without making it "drag anchor"! The mollusk with the reptilian habits is popularly known as the Cone Shell, but is not very popular. Still, it is perhaps less undesirable than the parasitic worm, fairly common in the Orient, which departs — somewhat violently — from its host when near the water in which it began its life cycle.

More familiar to many of us is the black-and-white striped spider which

haunts the sunny side of old barns and walls, leaping out into space to catch insects on the wing, stopping in mid-air and climbing back by means of its silk-like thread attached to the wall. Its size here is not unreasonable, for the same radio-active potassium in this moon's soil was prevalent in the Earth from the Carboniferous to the Jurassic periods, and is believed responsible for their rampant growths. But this spider's remarkable jump? It is a simple consequence of its size for, proportionally, a spider jumps some 200 times farther than a tiger!

As for the Moon-Maid's sheer but stalwart stockings, if we do not have their counterpart on Earth today—*we shall tomorrow.* Out of coal, water and air, chemists have synthesized protein-like fibers as fine as silk, as strong as steel! Soon we shall have these filmy stockings—and we shall play tennis with racquet strings and go fishing with lines made of the very same material!

Now, however, let us see if these fictional laboratories we have just entered can offer *anything* not already known to us in reality. . . .

BLINDING light glares down on row after row of huge glass tanks surmounted by bubbling retorts and trickling graduated-measure tubes. Jets of steam drive through furnaces of molten metal and vapor is drawn off into the convolutions of distillation apparatus. This is the protein room, where simple elements are manufactured into the building-blocks of all living matter!

We pass through other rooms, where air-driven centrifuges are whipping together the giant molecules of hemoglobin and enzymes, where specialized cells are developed in cultures of lymph, and come at last into the most remarkable place of all. Between the poles of a gigantic magnet a cyclotron generates its high energy atomic particles. Before its target window, and under the blue glare of a battery of x-ray tubes, stands a small tank. In it floats a number of tiny, inert blobs of gelatinous matter.

Suddenly one of them stirs—*with life.* We have seen the miraculous generation of living matter!

See Marvel's companion science magazine —DYNAMIC SCIENCE STORIES for another glimpse into the future (Excursion to Possibility[n]) in "Roundabout" a new department.

Life in Glass

YET does it partake of a miracle? Our biologists know the composition of living matter, the exact proportions of every element! In laboratories, carbides have been compounded of carbon and heavy metals; superheated steam has formed them into hydrocarbons, the simplest of organic compounds. Water alone—and time—turns them into more complex hydrocarbons, acetylene, acetaldehyde, acetaldol out of two molecules of the latter—and so on up to the fatty acids. Or, again, carbon and water, under the action of strong light, form carbohydrates; when nitrogen is added, amino-acids. Then only sulphur, and we are to proteins—the basis of living matter!

Indeed, it is in some such manner that science accounts for the beginning of life on the Earth, with the youthful sun glaring on the simple elements swept together by erosion and precipitation. But *the vital spark?* Perhaps a product only of the increasing complexity of molecules, perhaps of cosmic rays or the radium in the sea. Perhaps, for that matter, our hosts themselves do not know, but are content to supply atomic bombardment and radiation—and accept the accomplished fact!

Might we not do the same? . . .

We have now been whisked into what we are told is the "assembly room." Its walls and floor are black, its tables and benches black, everything in the asceptic, dustless room is black except the white-gowned workers who move carefully about the huge glass vessel that dominates the room.

The vessel is strangely-shapen and contrived. It seems almost a futuristic statue of the human body. It appears to be put together of many separate parts, some with great protuberances in which gases or liquids circulate. In fact, as some of the laboratory assistants step back, their work done, we see that it *is* assembled—and we see also the reason for their care. It contains a living man!

Or is it but all the parts of a man brought together? No! For as the last worker completes some final adjustment, he turns a petcock in a bulging part of the glass head-piece—and in an instant the man's eyes flicker open!

(Please turn to page 127)

Burke could barely see through his view finder to train his lens upon the troops



Inventor Tom Burke built a polyceltron iconoscope—and synchronized sound and vision to scandal-blast a city-wide political intrigue with his all-permeating broadcast televisor!

NEWSCAST

by HARL VINCENT

SLOUCHED in his overstuffed chair behind the desk, Emmett Graves sat tapping the polished mahogany surface before him with pudgy fingers while he stared at the blank rectangle of the newscast receiver on the opposite wall. There had been an interruption in the service for two minutes and he looked often and angrily at his ornate platinum watch. In eight more minutes the sports flash was due to go on. Meanwhile, this war news—most important of all—was ruined. Unless it came on again at once.

"Young fool ought to be back on police court work!" Graves raged impot-

ently. He rolled the frayed end of a black cigar from one side of his thick-lipped mouth to the other.

Miss Hennessey, his pretty secretary, tiptoed into the room, laid a sheaf of papers before him and noiselessly disappeared. Just as well, Graves reflected grumpily. She was too high-hat, Miss Hennessey was—she'd refused him dinner dates, theatres, even had given his flowers to one of the stenographers in the outer office. He'd have to fire her and get a new one.

But this service interruption was more important at the moment than any secretary, whether she high-hatted him or not. As President of International Newscasts, the pompous little fat man was taking his job very much to heart for the first time in many moons. Tommy Burke, his star reporter, had fallen down on him. And usually Burke was not one to do a thing like this unless the reason was a mighty important one. Well, he'd fire *him* too if this interruption continued for long.

Three minutes, four—five! A check showed him that All-World Newscasts still had the war flash on. With a wrathful grunt, Graves put a blunt fingertip on Miss Hennessey's call button. The girl was at his side so quickly and soundlessly that he started visibly.

"Get Burke on the radiophone," he directed, mopping his double chin with a lavendar silk handkerchief, "and get him quick. Ask the blasted idiot what's wrong with the newscast."

"Tommy is at the front," Miss Hennessey reminded him.

"Oh, Tommy it is? So that's the way the wind blows." Graves glared at the girl, then shook himself deeper into his chair. "Well, get our Tampico station then and have them get through to him via the Loyalist Signal Corps. You can do it in a minute if you don't stand there dreaming. Hurry now."

"Yes, Mr. Graves." Again the silent departure.

But the battle front was never reached by radiophone, nor did that one particular newscast resume. The portly President of International nearly died of apoplexy in the next long moments. All-World had made a complete scoop for ten important minutes.

Entirely out of God's knowledge, in the hottest battle sector in central Mexico, Burke had been televising and picking up the sound, not to speak of sending in the frequent announcements of what was to be learned of the fighting in other sectors. This was nothing new to Burke; he was a veteran at war reporting and was as much excited by it all as if he had been a combatant. And he had never quite gotten over the thrill of knowing that, all over the world, millions were seeing the results of his camera work and hearing the yells and rumblings of guns, the shrieking and detonations of shells which were picked up by his banks of microphones. And loving it too, these millions. Bloodthirsty to the last one of them. Especially when sitting snugly and safely at home before their own private newscast receivers or when lounging in one of the public squares where International had installed huge mirror screens and amplifiers and where the roar of battle could be heard as loudly as at the front.

NO, Burke did not mind. Not that way. But he had been here too long now; the monotony was beginning to tell on him. Besides he was most anxious to get back to New York—there was that invention of his to perfect and it was an important one. Burke was a real scientific experimenter, only keeping to his reporting so he could pay the freight.

"That puffy old lady-killer," he told his radio man, "ought to be out *here* for a while. I'd love to see him in a gas mask, to see him turn tail and waddle away from the creeper clouds."

"Who? What?" The radio man removed his headphones.

Burke had come back to the twin short wave transmitter from his own televising camera and microphone banks. The transmitter was a good two hundred feet behind the front line trenches for a measure of greater safety. Much good that did at times!

"Graves. The stubborn ox. Doesn't even answer my radiograms."

The radio man grinned crookedly. He knew how anxious the tall young reporter was to return to the States. "Better get back up in front," he said. Then he watched the lanky figure as it stooped and crept through the communicating trench, tin hat askew, gas mask and holster dangling from his belt, boots caked with mud. Burke was a good scout.

Dropping into his cubby off the front trench, the reporter checked the focus of his telephoto lens through the periscope at the top of which it was mounted. The image it projected on the plate of the pickup tube was perfect.

He swung the periscope around, sweeping the Rebels' front lines and the narrow strip of pock-marked land which lay between the two lines. If this was what the newscast public wanted, let them have it. Suddenly he was alert; his view finder showed a thick red cloud rolling eerily up from nowhere and spreading. A creeper cloud! The signal for gas masks came down the trench. Burke had his on in a jiffy.

Captain Volez swept past him, running.

"What's doing?" the reporter called to him in Spanish.

"A charge—coming. Good picture."

The sound of the heavy artillery, the shrieking and bursting of HE shells, the rat-tat of machine guns rose to a deafening roar. The sound of the planes overhead was an unbelievable clamor. Mud flung high as a barrage was laid down by the Rebels ahead of the creeper cloud. These deadly gases could be dispersed by flame projectors if their fusible elements could be reached by the licking, searing blasts. "Modern warfare" was pretty much the same old stuff, Burke reflected. Just bigger guns, more powerful explosives, deadlier gases.

Loyalist troops streamed through the trench behind him, bound for the point where the sally was headed. The creeper cloud came on. The barrage was in the trenches, then had passed beyond. A clang and a heavy blow on the reporter's helmet drove him to his knees and nearly deafened him. He had a charmed life.

The red gas rolled down now upon the Loyalists, filled the trench. Burke could barely see through his view finder to train his lens upon the charging Rebel troops. Oh, the newscast hounds would eat this up!

CRASH! The view finder was driven painfully against his cheek. He looked up at the top of his periscope and saw it was gone. So was a perfectly good F-O. 9 telephoto lens, the third one in a week at six hundred smacks a copy. Burke swore softly as he went back through the communicating trench.

The indescribable ear-splitting whistle of an HE shrilled overhead, too close for comfort. Burke flattened himself instinctively. Then, Whang! All Hell seemed to break loose. Mud, rocks, debris, rained on the prostrate reporter. That one *was* close. Painfully he dragged himself from the mess encumbering him, slowly he crawled back toward the transmitter.

Where it had been a deep crater, still smoking. Twisted bits of wire, fragments of glass, were all that remained of the twin radio apparatus. A dismembered crumpled form thrown up on the edge of the crater told him what had become of that decent little radio engineer. Burke swore feelingly.

"Damn Graves anyway!" He made his way over the top, ducked into another communicating trench and started for the rear. "I've told the fathead a dozen times to install the transmitters in fast armored tanks. God knows *they* cost enough to replace. But you can't replace the poor guys that run them. I'm going home—to hell with Graves."

A Loyalist army plane whisked him to Mexico City in two hours. From here Burke sent a radiogram to Graves:

"Am taking next stratoplane home. Lenses and transmitters don't grow on trees. Neither do swell radio engineers. And there are no trees where we were. Hope, it hurts you a lot to accept this collect. I'll make it long and expensive. Will be home in a few hours but am going to get a good night's sleep and will see you in the morning in good little, dear little old New York. My best regards to Miss Hennessey. Has she accepted your customary dinner invitation yet? I hope not, for her sake. Burke."

If Graves had been purple with near-apoplexy before, he was almost black when this radio reached his desk a few hours after the trouble with the war newscast. He reached for his vacuum bottle, found it empty of ice water.

"Miss Hennessey!" he shouted, forgetting even to ring for her. "What's the matter with the thermos bottle. Get me some ice water."

"Yes, Mr. Graves." The girl had whisked away the bottle and was returning with it refilled before he had mopped the perspiration from his creased brow.

"You're fired!" he roared at her.

"Oh, thank you, Mr. Graves,"—sweet-

ly. "That means two weeks' pay is coming to me. Thank you again. I already have a new position with All-World. Will you sign this voucher, please?"

Miss Hennessey, not now so sweet and pretty in Graves's glazed eye, thrust a paper before him. It was an order for two weeks' pay ahead, on account of her release by him. The little vixen had already filled it out.

"But—but—"

"Sign right here, Mr. Graves." His erstwhile secretary did not use such dulcet tones this time.

Graves signed, noting the glint in the girl's yellow eyes, then sank back in his chair exhausted. These youngsters would be the death of him yet. All-World. Damned upstart outfit; they'd not get the best of Emmett Graves nor of International.

He turned in disgust from the "Every Day a New Menu" newscast and flipped the switch which shut off the uninteresting sight of a scrawny woman mixing a most appetizing—but not to him—salad, and the sound of her shrill, monotonous voice as well. He'd have to do some more firing. This feature could go to All-World for all he cared.

Again he looked at Burke's radiogram, snorted, crumpled it in a tight ball and deposited it carefully in his wastebasket. Then he looked once more at his expensive timepiece. After five it was! Holy Smoke! Mrs. Graves would jump down his throat. He became a volcano of activity, crammed his hat on his head, turned out the lights and scurried for the elevator.

BURKE arrived at his combined laboratory and bachelor quarters late that night. After a luxurious bath and shave, he went at once to the laboratory and dusted off his beloved apparatuses. For the time, Graves, the Mexican Revolution—everything—was forgotten. He had something here which would revolutionize newscasting—maybe. At any rate it was something worth working on and bringing to the point of perfection. He worked all night with his special televising camera, his pickups and the recording apparatus. And with something that looked suspiciously like an x-ray.

None the worse for his months of grueling war experience and the loss of another night of sleep, he appeared bright and early in the morning at the midtown headquarters of International. He breezed into Graves's outer office with his usually unruly mop of blond hair slicked meticulously back and with a gaudy cravat conspicuous under his opened lapels. Burke never wore a hat nor did he care much about his personal appearance. He whistled as he entered.

The whistle dwindled from a defiant one to a very subdued sound, a mere chirp of sheer amazement. For a girl sat on one of the benches where Graves usually kept them waiting; a real dream, she was. Blue eyes, hollowed underneath—peaches and cream complexion—a pert, upturned nose—saucy red lips. But she was painfully thin, her dress was shabby, and her funny little hat a mess from the rain of the night before. Obviously this girl was on her uppers, just what old Graves was always looking for.

Taking an even closer look, Burke made up his mind then and there that this was one girl the old man would not make a fool of. He stalked to her side and asked boldly: "Anything I can do for you, Miss?"

"Why, do you work here?"—coolly.

"I haven't any hat on, have I?" Burke's smile was infectious and the girl didn't know that he always went hatless.

She smiled wanly. "Well," she faltered, "I'm looking for a job. It was on the public newscast last night—'Secretary Wanted,'—so I came to see about it."

"I'm just the man you want to see," the reporter told her. "If you'll wait a few minutes in this conference room I'll be with you."

Unhesitatingly she followed him. Burke closed her in the small room and went to bang on the boss's door. No secretary was in the outer office.

"Come in!" blared the little big man's voice. Burke went in.

"Morning, Graves," blithely. "Where's Hennessey?"

"Fired. Same as you'll be. What do you mean 'Morning?', you jackanapes? What'd that crazy radio of yours mean? Twenty-eight dollars it cost International." Graves banged on his desk.

THE reporter grinned. "Keep your shirt on, boss. You can do your blowing off after I've finished. I'm through

in Mexico. No more for me. Know your last transmitter down there was blown to Kingdom Come yesterday and a dam' good radio man with it? I'll not take another of these assignments until you see the tanks for them like I told you. Three lenses in a week—of course that's not so bad. Eighteen hundred smackers doesn't mean as much to you as twenty-eight for a radiogram you damn well deserved. Not for lenses—as long as your newscasts are on the air. I'm through I tell you."

Again the banging of the desk top. "You're telling me!" Graves bleated. "You're fired. Draw your pay and get out."

"Oke. But you didn't tell me about Hennessey. Fire her, too?"

"Yes, if it's any of your business."

"Couldn't make her, eh?" Burke's voice held deep loathing.

"Get out, I say! Get out!" Apoplexy threatened once more.

The reporter retired to the little conference room, where he took the blue-eyed girl by the arm. "Come on," he said, "we have to go to another office. We'll talk over the job there." He found she needed some assistance in getting to her feet. Why, the poor kid was starved!

She followed him without question and Burke was glad that Graves had not started out from his private office after him. Other girls were now in line in the anteroom for the actual position.

"What's your name?" he asked the girl in the elevator.

"Nina Cowan."

"Nina." Burke sort of rolled the name over his tongue.

"And my experience," she began, "has been—"

"We'll let that go until later. Had any breakfast?"

"Why—why—"

"You haven't. Neither have I. We'll eat first."

"But." They were on the street now and Burke was piloting her into one of his favorite haunts.

"No buts. We eat."

THEY ate, the girl ravenously, Burke observed. Color was starting to return to her cheeks and her eyes looked brighter already.

"You haven't told me who you are?" she reminded him as they sat over their coffee.

Burke told her.

"Oh, I've listened to *your* newscasts often. They're the best—"

"Forget it," the reporter interrupted. "It's up to me to confess. I was just fired from International and I want to put you to work—for me."

Nina Cowan stood up suddenly. "But it was Graves who wanted a secretary. You've deceived me."

"Listen now; Graves is a bum. All he thinks of is running around with his secretaries. That's why the last one was fired. You're too darned nice for—"

"I can handle that sort. But not a liar. Good-bye, *Mister* Burke. I'm going back and get that job. Thanks for the eats."

Nina Cowan was gone and with her going the sun seemed to set and the day become gloomy. Burke paid his check and left for his uptown quarters.

Work is a cure-all sometimes. Burke worked as he had never done before for the next few days. But he did not forget Nina Cowan. He checked up with some of his old pals at International and learned that she had landed the job with the Old Man. He hated to think of her in that office, of the Old Man's pawings. With Hennessey, now, it had been different—that had merely struck him funny. Hennessey was a nice enough kid, of course. But Nina was somehow different. He could have wrung her neck cheerfully at this point.

He immersed himself more deeply in his work. The laboratory was a shamble of coils, condensers, vacuum tubes, batteries, and built-over motor-generator sets. A standard newscast receiver stood unused against one wall. Burke was working on the pickup end of the apparatus.

Late in the afternoon of the fifth day after his dismissal by Graves, he suddenly jumped up from his work and sent a long and carefully written radiogram to the chief of the Federal Bureau of Investigation in Washington. He had something at last, he knew. One last little touch and it was to be perfect. The standard newscast pickup apparatus was entirely satisfactory, of course, but it was bulky. The camera itself was a simple affair, using a huge polyceltron vacuum tube with an eight by ten plate on which the images from its fast lens were pro-

jected. The dark and light images produced the myriads of impulses required for transmission by radio on one frequency while the sound impulses from the microphones were transmitted on a second frequency. The result in simultaneously tuned reception and reproduction was as perfect as could be desired. But the experimenter was after important improvements.

Burke had always wanted something compact. More than that he was obsessed with the idea of producing perfect recordings of sound and vision pickups simultaneously so they could be reproduced at any time desired. This had not yet been done successfully, due to various factors that made synchronization difficult. Then there was a problem of televising and sound pickup in places difficult of access. That was where the modified x-ray eame in. The only thing now holding him back was an ultra-sensitive microphone that would not blast.

He had just about reached the solution when his buzzer roused him from his work. This was five days after his dismissal by Graves.

Burke sauntered to his door in carpet slippers and shirt sleeves, with three days' growth of beard ornamenting his jowls. It was Nina!

The girl pushed past him into the room. She was flushed and excited. "You were right—Tommy. And I was wrong. I'm sorry."

The reporter's jaw set. "Graves try anything funny?"

"Y—yes. And I quit. Your job still open for me?"

"Oughtn't to be, young lady,"—sternly. "You took a run-out powder on me, you know."

"Oh, I *am* sorry. When can I go to work?"

Burke had to grin in spite of himself. "Now. Sixty a week. I have a flock of notes I want typed up. Here, this way. And don't think I'll try to get fresh, either."

He led her to the typewriter desk in the laboratory, handed her a jumbled mass of scribbled sheets and told her to go ahead. Then, a wave of embarrassment sweeping over him, he returned feverishly to his own work. The click of the typewriter was music to his ears.

From time to time the girl watched him from the corner of her eye. He did not know she was noting his every move with avid interest. But she caught him several times when he stole glances at her.

And when finally, with headphones clamped tightly to his ears, he yelped, "I've got it!" she came flying to the workbench.

"Got what?" she demanded.

"*It.* The last link in the chain. Now we *have* something."

Nina Cowan sat on a high stool at his side, staring at the—to her—bewildering array of mechanisms. "Tell me all about it," she pleaded.

BURKE had kept his ideas pent up for so long that it was great to confide in someone. And no confidant could have been more welcome than Nina Cowan. "Sure," he enthused. "I'll expound."

He expounded. Four mechanisms there were, each like nothing the girl had ever seen. Burke enclosed them separately in leather cases with carrying straps. He picked up the smallest of the four, which was only a handful to carry, pointed it at the girl's curly head. She saw it had a big twinkling eye of a lens.

"This," he told her, "is my camera."

"A televisor?"

"Nothing else. And the side—this bump you see—is the regular microphone which picks up ordinary sound."

"Now, wait a minute," the girl broke in. "Tell me how the modern television operates. I've always wanted to know. Maybe I'm a dumb-Dora but I've seen the cameras and microphones and of course plenty of different sorts of receivers. Still I don't get it."

"Perfectly simple." And it was not simple at all to Nina, though Burke clumsily tried to make it so. "Here's a lens that projects an image. What on?—a plate in a vacuum tube. Iconoscopes, they used to call these tubes before they were perfected for color. The plate in this tube catches the image, converts it into electrical impulses and—"

"*Wait* a minute. How?"

"Aw, easy. The plate is divided into five hundred lines of tiny cells over which the light beam travels sixty times a second from bottom to top, because the lens inverts the image."

"Skip it," Nina said wearily. "I'll never get it in a million years."

"Okay—I thought you wanted to know." Burke picked up his miniature televisor.

"Mean to tell me this little thing takes the place of the huge cameras the reporters use? The ones that take two men to carry them and have a truck following them?"

"Sure. *My* polyceltron tube has the same number of cells in a one by one and a half inch plate as the big ones do in eight by ten. And here is my truck."

Burke strapped a larger case to his belt and attached it to the wires of the televisor and built-in mike. "This is no transmitter," he explained, "but a voice and vision recorder which magnetically and permanently writes down on a metallic tape the electrical impulses from the tiny polyceltron in the camera and from the voice amplifiers. At any time or from any standard transmitter these impulses can be sent out as perfectly synchronized newscasts. Or, for that matter, this recorder can be used for the theatrical telecasts if this should prove to be desirable."

"All right, Mr. Professor; can present happenings be kept in a little roll of metal tape and reproduced a hundred years from now?"

"A thousand years, if necessary." Burke was showing the workings of his apparatus.

"Hm. Good stuff," the girl commented. "But not for newscasts."

"Right." Burke grinned at her perspicacity. "The news hound wants the news when it happens, not in a thousand years."

"Then what's the object?"

Again the experimenter grinned. Nina was a smart girl. "There is a still more important field. You haven't seen the half."

He removed the third mechanism from its case and set it close to the wall, wiring it to the first two. There was a whir and he raised the camera to eye level, aiming its lens at the blank wall.

"You don't by any c h a n c e think you're taking a picture?" the girl asked him.

"Sure. Now watch." The fourth case was opened and more wires appeared. A small cable led to a round case with a rubber suction cup which Burke moistened and attached to the steel wall. Once more the whirring started. "And sound as well, unheard sound," he added.

In a few minutes he shut off the power and removed a small reel from the case at his belt. "This," he told her, "is a complete record of what has been going on in the next room."

"You see," he intoned, "the vision goes out on an extremely high frequency, the sound on a much lower one. In ordinary news or telecast reception no difference is noted by eye or ear in the lag between the two widely different waves. But in a recording that lag has always until now presented difficulties. Now we—"

"Shoot it," the girl directed. Her eyes brightened with more than comprehension, bluer than ever.

BURKE inserted the reel in what looked to be a short wave radio transmitter. Then he dimmed the lights of the room and turned on his newscast receiver. "It only takes impulses from my own transmitter now," he explained.

In a moment the vision screen lighted. Flickerless and clear, there was the view of the next room. A modern living room, where a man sat at a table eating his dinner. It was perfect—and taken through a steel wall. The man laid down his knife as a woman came in and sat across from him. Still there was no sound, though the lips of both were moving in speech. Nina recalled that Burke had not turned on the sound recorder in the beginning. That was what the case with the suction cup was for—it picked up the sound beyond the wall. It must have tremendous sensitivity. Without its help *nothing* could be heard through that sound-proof partition with its deadening layer between the two vertical sheets of metal.

Then it was there, the speech of the man and the woman, the clatter of knives and forks and dishes. Petty table conversation, that of almost any average man and wife at dinner. But clear and lifelike as if transmitted from one of the huge stations of International or All-World. And with this diminutive and revolutionary equipment which could see all and hear all.

The girl gasped as Burke switched off his apparatus and the lights of the laboratory came on. "I see now what you're driving at," she exclaimed delightedly. "You've got something here."

Burke wondered amazedly whether

she *did* see.

"I think so,"—soberly. Then he handed her a radiogram that he had just received from Washington. "And now, Ni—Miss Cowan—please read this and answer it at once—just a short formal acceptance."

When he saw her look of amazement as she sat before her typewriter reading the radiogram, he knew she did understand.

"After that we'll see Graves," Burke concluded. "You and I alone together. We'll see him about lots of things."

The pair sauntered nonchalantly into Graves' outer office, Nina gamely insisting on carrying the case which housed the penetrating ray generator. Burke, with the other cases, winked at Gloria Fay, the redheaded reception clerk.

"Who's with the Old Man?" he asked her.

"Only the Mayor and his Better Housing Committee. Why—and why the Christmas tree effect?"

"Oh, these are bombs," Burke assured her, patting his three cases. "Mind if we go in and blow up the Old Man?"

"See if I care. Bust right in." The Fay woman chewed her gum violently, then added, "There's a bunch of dames after the secretary job again—waiting." She looked significantly at Nina.

"Perfect," said the erstwhile reporter. "Come on, Nina."

They passed the line of waiting applicant, some pretty, some not so hot. All of them looked anxious. Graves would have a lot of fun with this assortment—if he could. He always tried hard enough.

BURKE strode to the outer wall of the Old Man's office with Nina at his heels. The line of waiting women observed them curiously, probably setting them down as a repair crew. Burke set up the four mechanisms, attached his supersensitive microphone to the wall, and switched on the juice. He kept his tiny camera moving in a slow arc to cover the interior of the room behind that double insulated steel wall—to cover all of it. The recorder whirred on.

Soon there were stirrings within, voices that now could be heard through the uninsulated door as men came to its inner knob. Rattling of the latch. Burke switched off his power supply.

"Come on," he told Nina. "Let's move."

They moved, lounging over to a window of the outer office that overlooked the river.

Filing from Graves' office were some of the most prominent dignitaries of the city, most of them looking rather sheepish. One of the waiting girl applicants for the secretarial position, probably the most attractive of the lot, was called into the sanctum sanctorum.

Burke rushed to his instruments as soon as the door closed behind her. The Fay woman had approached and was looking interestedly over his shoulder. "Go away," he said. "This is going to be good. But not yet—there's nothing to see for a while."

The penetrating ray and the weaving camera lens—a gleaming bull's eye of optical glass almost as large as the televisor itself—were in action only a few minutes when out rushed the girl who had entered the room. She was red of face and disheveled of hair.

"Swell!" exulted Burke. "Come on, Nina." He grabbed up his instruments hastily.

Another of the applicants had been called for, but Burke winked at Gloria again suggestively and strode into the Old Man's office instead, with Nina trotting contentedly at his side.

Graves looked at the two in purpled astonishment. His fat fist began to hammer on the desk as his former reporter bolted the door from inside. "What in the devil?" he spouted. "The two of you—so help me—together! You've a nerve."

"Keep your shirt on," Burke counseled. "We've something to show you. Something worth while to you. Something worth while to International, interesting to the entire world. My own invention."

"Oh, all right." Graves had never been one to pass up a chance of a patent steal. There had been many of these, as Burke well knew but could not have proved. "What is it? But make it snappy."

The political newscasts were on the large receiver. Burke turned them off. "Now," he said, "cut out your regular frequencies and plug me in on the local shorts. Got to show you this."

Surprisingly, Graves complied.

The whir of Burke's recorder lighted up the screen and started the sound. The President of International Newscasts gasped when he saw himself pictured right here at his own desk and heard the words of raw political intrigue he had exchanged with the Mayor and his Committee. If this ever went out over the air it would mean utter ruin. . . .

"Shut it off. Name your price."

"There isn't any price." Burke shifted the tape.

HERE was the Old Man desperately trying to make love to the last applicant for what he called a position. His foolish words of pseudo-endearment made Nina giggle.

"Shut it off!" Graves's pleading was panicky. "If Mrs. Graves ever should see *this* recording."

Burke was grinning down at him. "Enough?" he asked. "Going to be good now?"

"It's enough." Graves nodded, then looked up, white-faced. "Ten thousand dollars for your invention," he offered. "Why, International can expose all sorts of things with this. Your jobs back, too, both of you—at twice your last salary. Is it a bargain?"

Nina sniffed. "A bargain! It isn't even interesting."

Burke was slinging his cases over his shoulder and to his belt. "No go," he said. "International expose things? You're crazy. Just newshound stuff is what you want. Blood and thunder stuff to keep the sheep in line, to make International the superior of All-World. You don't know from nothing, Graves. Let this just be a lesson to you—no price connected with it. Except you've got to put those front line transmitters in tanks like I told you."

"I will, I will. Anything! But—but—you won't turn this invention of yours over to All-World."

"A better place than that. To the Federal Bureau of Investigation in Washington."

"Not this reel you just showed?" Graves surely would die of his bursting veins.

Nina and Burke were at the door and Graves waddled after them most ludicrously. "*Please,* Burke—you know me—you had a good job with me. I'll do anything. If my wife—"

"Yes, I know you." Burke laughed. "Don't worry. I'll not turn in this reel yet—I'll just keep it to make sure you behave yourself from now on. You're on probation—with me, now. It's about time the newscasters of this country kept out of crooked politics."

Waiting for the elevator at the reception desk, Nina hugged close to Burke's side. "Won't it be grand?" she said. "In Washington, with your new G-man job, we can live *swell.* You'll be in something you can be proud of—and *I'll* have a man to be proud of."

Burke reddened—stammered. "M—mean it?" Nina was proposing to him! He'd have never had the nerve himself.

"Course I mean it—Silly." Her bright eyes looked up into his astonished ones invitingly.

And the Fay woman almost swallowed her gum when she saw Tommy Burke lift the little blue-eyed girl from her feet and kiss her resoundingly on lips that obviously were most receptive.

Excursion to Possibility [N]

(Concluded from page 118)

Swiftly then they dismantle the glass, he steps forward unaided—and another Moon-Man joins his companions! . . .

And yet it could happen on Earth. The very laboratory, and the achievement we have just seen, is but a composite of those of Carrel, Harrison, the dean of American biologists, and the many who have followed in the latter's steps! Between them, they have grown bits of eyes and ears, limbs and bones, hearts, glands and all the rest. They have synthesized serums to feed their "orphan organs" and perform other functions of blood. They have, with the perfusion pump developed by Carrel and Lindbergh, given them hearts and lungs, and Lindbergh is now at work on a glass kidney. They have made these hearts beat, and pancreases produced insulin. They have done everything but put the parts together!

Truly, considering all our science has already accomplished, and the tremendous acceleration of its progress, the question seems to be: Can science fiction keep up?

Perhaps we shall yet find a place where it still offers marvels of which there is no hint here on Earth, for we are off to an unknown destination in hyper-space on our next Excursion to Possibility[n]



Write us your question on scientific subjects. So far as space permits, all will be answered in these columns. Preference is given to those which seem of the most general interest. Tell us what you think of our choice.

VEST-POCKET INVISIBILITY

Dear Sir:

Is glass treated by the new process recently described in the newspapers completely invisible?—L. M. R., Batavia, N. Y.

All material objects are seen by reflected light, except for obvious cases of radio-activity, fluorescence, etc. Glass, which does not belong in the latter category, we normally think of as transparent. Yet it reflects 5 to 10% of the light that falls upon it, and thereby becomes visible to our eyes. The new process (actually there are TWO, discovered independently), reduces reflection to less than 1% BY COATING GLASS WITH VARNISH—and thereby renders it practically invisible!

If our correspondent is a purist, however, we sball have to admit that the glass does not become completely invisible; under certain circumstanees it can be detected visually. Yet anyone who has ever picked his way through the "Crystal Maze" in an amusement park, and rashly stepped through an "opening" in the lahyrinth that turned out to he another sheet of glass, can testify that "practically invisihle" has real meaning!

Glass treated with the new varnish is far more difficult to see than that in a crystal maze, which depends upon illusion caused by a confusion of reflections. More scientific are parabolic windows, whose remarkable clearness is achieved by direeting reflections away from the ohserver and into baffles of black cloth. But the "magic" varnish does something to light itself—and therefore is another stride along the path, already partly traversed by science, that leads to the perfect cloak of invisibility!

The General Electric process, whose announcement preceded hy only a day one from Massachusetts Institute of Technology that received less newspaper notice, arose out of studies of monomolecular layers of oil, films only ONE MOLECULE THICK. It may seem paradoxical tbat dipping glass in such films, in effect PAINTING it, will make it less visihle, but these extraordinarily thin films are tbemselves invisible. Moreover, if applied in layers of just the right thickness, they alter the length of the light waves reflected from the glass so that incoming waves CANCEL them!

Both processes—the M. I. T. films are formed by condensing the vapor of fluorine compounds—use coats of varnish about one-fourth the thickness of the average wave length of visihle light, or 4/1,000,000 in. The crests of turned-back waves are then made to coincide with the troughs of incoming waves, and reflection is cancelled. More significant, the light annulled in interference is not lost, but is ADDED to what is transmitted!

Thus the transmission ability of glass has been raised to as high as 99.6%, an improvement of great importance to makers of all optical instruments—particularly those complex instruments of many prisms and lenses where the cry is ever: MORE LIGHT!

What is the effect of this high ratio of light transmission on the glass itself? It is practically invisible, which is to say that a small piece viewed at close range could be detected only by the refraction at the rim. But if one were approaching a long wall of glass treated by this method, it is quite certain that the closest scrutiny of the ground out of which it rose would not keep him from bumping his nose!

The obvious shortcoming of this process is that it does not apply to opaque objects. Yet it points in the only direction in which it is believed the ideal mantle of invisihility can be found—bending light rays AROUND the object meant to be concealed. That phenomenon, of which there are examples in nature and which some experimenters believe they can duplicate, would enable a man to stand upon the brilliantly lighted stage of a crowded theater—and remain unseen!

This method, however, from the practical viewpoint leaves one important thing to be desired: the man bimself could see nothing! It is ideal only in the sense that it does not require any favorable external circumstances to attain its limited results. From the same practical viewpoint, science has already achieved hetter results. Its magical cloak, it is true, will work only under certain conditions. But under those conditions, it DOES allow a man to remain invisible and yet see what goes on about him!

It requires a source of ultra-violet light, a scanning screen or glass, and a condition of utter darkness. The darkness renders the observer invisible. The ultra-violet light, discernible only througb his special glass, reveals everything else in fluorescent light!

There is, additionally, promise that this method will soon be able to approach closer to the ideal of independence of surrounding circumstance—hy creating its own conditions! Experiment is progressing toward the development of a vapor which will at once act as a screen to conceal the observer and to scan objects revealed by the ultra-violet radiation!

Is it then, when we consider how storage batteries, compressors, X-ray generators and the like have heen "boiled down" in size today, a far reach from reality to a "scientifiction" hero with a vapor nozzle in one hand and a ray tuhe in the other—and around him the long sought mantle of invisibility . . .?

LIGHTNING STRIKES EARTH: EARTH STRIKES BACK!

Dear Sir:

I have seen pictures which show lightning, or some sort of electrical discharge, shooting OUT of the Empire State Building. What is this phenomenon?—W. G., Jackson, Miss.

Typically, in lightning, there is first a leader stroke which comes down from the negatively charged cloud to the positively charged earth, descending in progressive steps—often thirty or forty—all in one hundredth of a second! Sometimes the presence of a charge in the air creates by induction an opposite charge in the target, which may then emit streamers to meet the leader and GUIDE IT DOWN. Such is the explanation of the phenomenon associated witb certain extremely tall huildings.

But more remarkable is what occurs when a leader stroke reaches the ground. The main stroke, much more powerful, then SHOOTS UPWARD FROM THE EARTH!



Test yourself on these questions. Answers and scoring points are given on page 130. In every case tell *all* you can. For example, if the question were "What is a light year?" a full score answer would be "The distance traversed by light in one year, *which is approximately six trillion miles.*" But a partial score would be allowed for *either* the definition or the approximate figure (within a range indicated in each case).

1. Identify the following mathematical signs:
 $> \perp \sqrt{} \rightarrow \infty \pi g \mu$
2. How much is a dyne?
3. Distinguish between an aerobe and an anaerobe.
4. What are isotopes and isotypes?
5. Give the value of the Angstrom unit.
6. What are bismuth and azimuth?
7. Define quanta.
8. If nephritis is a pathological condition of the kidneys, what is a nephoscope?
9. Explain the difference between the law of definite proportions and the law of constant proportions.
10. How long does sunlight require to reach the Earth?

(Continued from page 6)

has several unpublished novels. Perhaps you should secure one of them . . .

D. D. Sharp, who had been absent from science fiction for quite some time, returned with an excellent short story. Incidentally, the title "Faster than Light" has now been used three times! Harl Vincent and J. Harvey Haggard previously used it.

Stanton A. Coblentz, who very rarely inserts satire in his short stories, did so this time. "The Weather Adjudicator" was a darn good story. I especially liked Chancellor Strumpf's statement when he said: "If we fight, it must be for some high principle, such as destroying democracy and the right of free speech." Is that satire? I wonder. R. R. Winterbotham turned out a swell little short story; good idea too, and cleverly worked out. Ley's article imparted something very original—and quite conceivably possible, too.

Congratulations on the readers' department. It could be expanded somewhat though. Add about three more pages to it and I'll be contented. And keep up those departments; they're all interesting and educational. But I contend that all science fiction is educational, despite the condemnatory remarks made by some people who consider themselves dyed-in-the-wool readers. In most cases they have been reading s-f for a year or so. And if anyone wishes to question me as to how long I've been reading s-f, here is the answer: I started in the summer of 1933 and have read every science fiction publication issued since then! That even makes me an "old-timer," doesn't it?

Best wishes for a prosperous 1939.

Robert A. Madle
Editor: Fantascience Digest
333 E. Belgrade St., Phila., Pa.

A CLASSIC

Dear Editor:

The rate of improvement in the first three issues of MARVEL has been incredible. Your splendid response so far to demands for quality encourages a hope that some day all the stories in each issue will be up to the standard set by "Faster than Light" by D. D. Sharp (its quality lay in the writing, NOT the science!) and Williamson's "After World's End," which latter may claim to be a classic. As for the February issue, it was the best so far; but all except the two stories noted above were exceedingly trashy, and by comparison with said two, made a sorry show.

No matter what vociferous readers say, Jack Binder is a good artist, when he takes pains. Schneemann some time, too.

C. H. Chandler, 920 College Ave., Wooster, Ohio.

COBLENTZ NOVEL A SCOOP

Dear Editor:

I am a steady reader of science fiction, and was very much pleased to see your new magazine, DYNAMIC, on the market. I certainly hope it proves successful, and that it, together with its companion magazine MARVEL SCIENCE STORIES, will reach new heights in popular science fiction.

Paul's cover for the initial issue was a fine piece of work, and up to his high standard. Very nice indeed. I hope you will continue with similar covers, showing futuristic machines rather than hideous monsters, etc. The feature novel, "Lord of Tranerica," was a welcome surprise. Until I saw it, I had lost hopes of Coblentz writing any more of his splendid satirical novels. The new yarn, however, pleased me very much, and you certainly have a scoop there.

"Mutineers of Space" did not appeal to me. Too bloody, for one thing; too obvious, for another.

"Quest of Zipantoric" was fair. Interesting reading, but not particularly new or thought-provoking. Why not scatter a few more scientific and "meaty" stories among the lighter ones which stress human-interest? I'm sure most of your readers would approve of such a move.

The short stories were satisfactory, though I expected more from "Message from the Void." The departments were good, but no different from those in MARVEL. Why not strive for something different along the line of departments? And why not have the questions in "The Test Tube" taken from facts contained in the stories?

All in all, the first DYNAMIC is far superior to the first MARVEL. It can stand plenty of improvement, but I expect we'll get that as we, the readers, show you just what we want.

Paul H. Spencer
88 Ardmore Rd.
West Hartford, Conn.

MUST HAVE PAUL

Dear Editor:

Allow me to congratulate you on your new magazine, DYNAMIC SCIENCE STORIES. Of course I must tell you how I happened to get acquainted. While looking over my newsdealer's assortment for something to read, I suddenly spied a book that looked mighty familiar. On picking it up I saw "Paul" in the lower right corner. Well that was enough for me. I have read science fiction stories for over 10 years, and I have only read those in which Paul was

(Continued on page 130)



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ARTHUR RHODES, Hair Color Expert, Dept. 25, LOWELL, MASS.

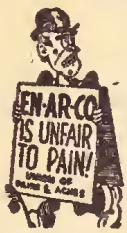
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WHAT'S YOUR ANSWER?

Answers to Questions on Page 129

1. >—is greater than, *or*, exceeds (1 point). ⊥—is perpendicular to; *also*, sometimes represents right angle (1 point for either). $\sqrt{\ }$ — the radical sign (1 point); when no other number is written above it (as in $\sqrt[3]{\ }$), signifies the second or square root of (2 points bore). → —a vector (1 point), representing a physical quantity that has length and direction in space, but no fixed position (2 points more). ∞—infinity (1 point). π—*Pi*, the ratio of the circumference of a circle to its diameter (1 point); 3.14159+ (1 point more, 3.1416 or 3 1/7 acceptable). *g*—the *acceleration* of gravity (1 point); equal to 32.17+ feet per second (1 point more, 32-32.2 acceptable). μ—a micron, one millionth of a meter; also, sometimes represents the numeral 40 (1 point for either).

2. That unit of force (4 points) which, applied to a mass of one gram for one second, will give it a velocity of one centimeter (6 points more).

3. An aerobe is a microorganism that can live only in air or oxygen (4 points); an anaerobe, one which flourishes without oxygen (4 points).

4. Isotopes are varying forms of an element (4 points), alike in most chemical properties (3 points more), but differing in atomic weight (3 points more). Isotypes are pictographs for conveying statistics by means of quantitative symbols (4 points).

5. The Angstrom unit, which is a special standard of length used in spectroscopy (4 points), is equal to .000,000,003,937 in. (6 points more, four billionths of an inch acceptable).

6. Bismuth is a metallic element (2 points). Azimuth is the angular distance of a star east or west of the meridian of observation, *or*, its altitude above the horizon (6 points for either).

7. "Bundles" of energy, units of radiation or assimilation of energy (6 points).

8. A meteorological instrument (4 points), used in the observation of clouds to determine their velocity, direction, elevation, etc. (6 points more).

9. There is none (4 points). Both state that a definite chemical compound always contains the same elements and in the same proportion by weight (6 points more).

10. Between 498 and 499 seconds (10 points, 500 seconds or 8¼ minutes acceptable).

(Continued from page 129)

the prineipal artist. I became so accustomed to seeing the characters in the stories the way Paul pictures them, that when the last mag he was working for went out of publication (Wonder Stories) I stopped reading. I tried a few issues of the other s-f mags but I was not satisfied with the illustrations. They were too, well I guess, frail is the word for it.

"The Lord of Tranerica," by S. A. Coblentz (another favorite author of mine) is SWELL. If you are going to continue using Paul for illustrations, and such good authors for your stories you can count on me to be a regular reader.

Laurence Henry
23 E. 117th St., New York City

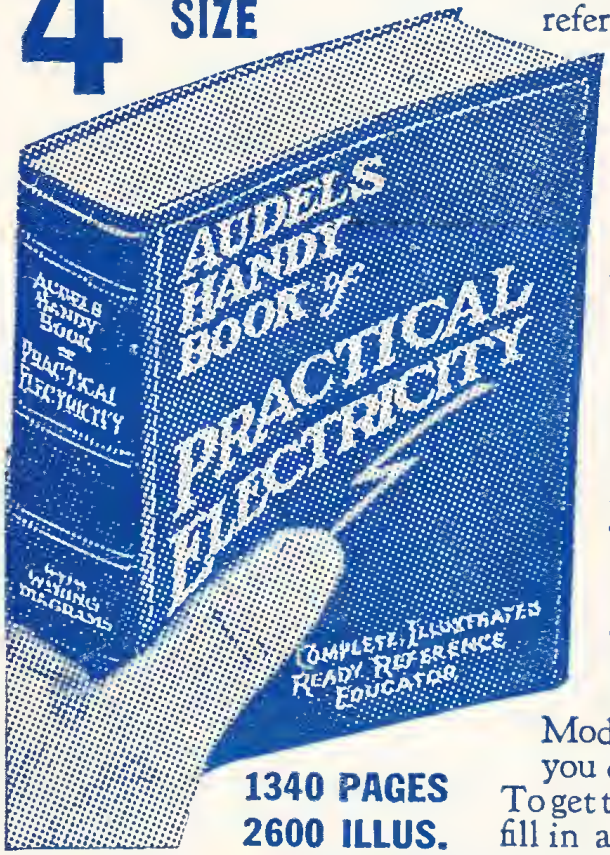
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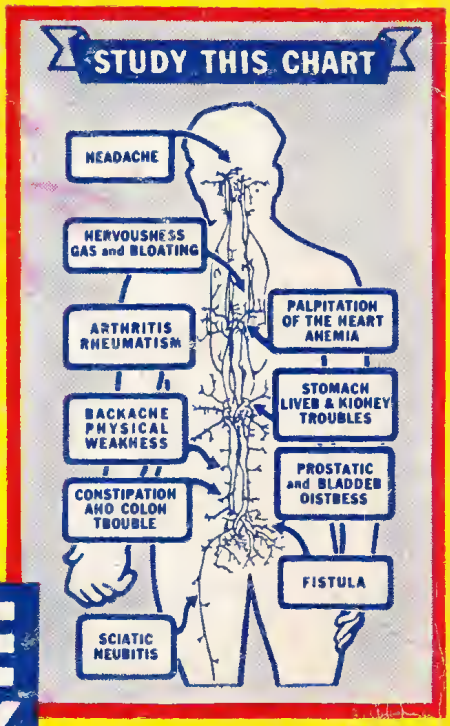
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